Vol. 127. Number 8 OCTOBER, 1927 Price 25 Cents

AMERICAN
GAS JOURNAL
Established 1859 Pioneer of the Gas Industry
Including · GAS INDUSTRY · Est. 1900 ·

18 Years' Service

without a dollar's worth of repairs

THE profit you make from the installation of a gas water heater can be lost many times over if it requires extended and expensive servicing.

Thus it is wise to make sure that the heaters you install will function efficiently over a period of years with a minimum of attention.

Hoffman Heaters have long been famous for their ability to deliver hot water year in and year out with little or no attention. We can point to countless installations which have been giving the utmost satisfaction for periods as long as 18 years.

Pictured here, for example, is a Hoffman Heater installed 18 years ago in the home of Mrs. E. Jedlicka, 1200 Melbourne Road, East Cleveland, Ohio.

In all that time it has not required the expenditure of a dollar for repairs, yet it is still in daily service!

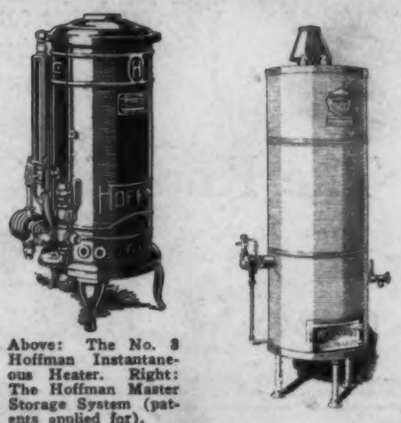
HOFFMAN

AUTOMATIC GAS WATER HEATERS

The Hoffman Heater Co., Inc.

1701-15 Eighteenth Street, - Louisville, Ky.

Hoffman is the ONLY concern manufacturing an absolutely complete line of water heaters, including instantaneous heaters in all sizes, domestic storage systems, multicoil storage systems, unit storage systems, tank heaters and house heaters.



Above: The No. 3 Hoffman Instantaneous Heater. Right: The Hoffman Master Storage System (patents applied for).

Library of Congress OCT 12 1927 Smithsonian Deposit

The New Koppers Continuous Vertical Combination Oven Plant *of the* Illinois Northern Utilities Co.

FOR years the Gas Fraternity has awaited the development of a Continuous Vertical Oven whose operating characteristics would include the regular and smooth descent of the coal charge and whose operating costs would be low.

Such a plant has been built and is now in operation at Sterling, Illinois and is successful beyond the most liberal expectations. Its operation is practically automatic since it requires no poking whatever. The combination feature, by virture of which it may be heated with coal gas or producer gas allows the maximum flexibility — its gas and tar yields are extraordinarily high. Its coke is of excellent quality.

Crushed run of mine coal is fed into the top of the ovens and the resulting coke is extracted continuously from the bottom, quenched and dry. The heat required for carbonization is remarkably low. From the superior operating results attained, the conclusion must be drawn that this is an ideal plant for the gas company with a moderate sendout.

Through the courtesy of the Illinois Utilities Company we invite visitors to see this remarkable installation in operation

The Koppers Construction Company

Designers and Builders of
BY-PRODUCT COKE AND GAS PLANTS

Chicago Pittsburgh New York

Vol. 127. No. 8 Whole Number 3646

American Gas Journal

Sixty-Eighth Year

October, 1927

Published Monthly by American Gas Light Journal, Inc., 53 Park Place, New York, N. Y.

S. G. KRAKE, Pres. and Treas. A. M. GLEASON, Sec'y.

H. M. RILEY, Editor

VISIT THE EXHIBITS

A gas convention without exhibits would be a somewhat dull and uninteresting affair. However, it must be borne in mind that the mere showing of the tools and mechanical contrivances which have been so indispensable to the advancement of our industry does not in itself guarantee the success of such display.

The value of an exhibit depends almost entirely upon its being visited and carefully investigated by those in attendance at the convention. An inspection of some certain booth and a brief conversation with its attendants might show the way to the entire solution of a particular problem that you have in mind. Moreover, the leisurely personal atmosphere of the exhibit booths in general will act as a tonic after a session with some of the more weighty procedure of the convention.

The upwards of two hundred display booths at the Chicago A. G. A. Convention should be visited by every one in attendance. They represent the best and latest efforts of the manufacturing end of the industry along mechanical and allied lines. They have a message of education and information that you cannot well afford to miss.

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Builders of STACEY Gas Holders for Seventy-Six Years

GAS HOLDERS

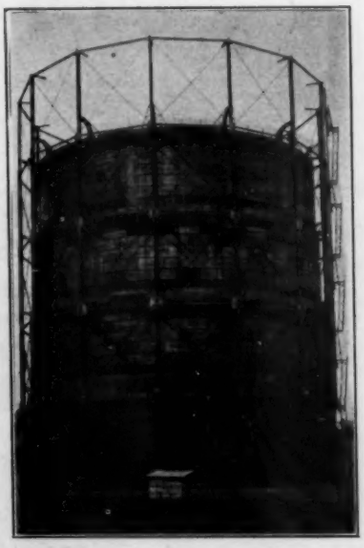
GAS PLANT EQUIPMENT

PURIFIERS

STEEL TANKS

CAST IRON VALVES AND FITTINGS

WELDED STEEL PIPE AND FITTINGS

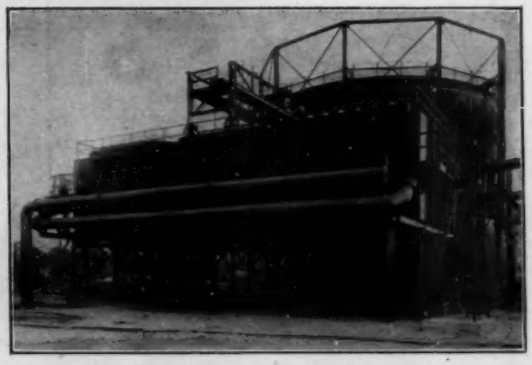


Builders of More Than 1250 Gas Holders

Booth 22 Ballroom

Pioneer Builders of High Pressure Gas Storage Tanks

A. G. A. Convention



THE STACEY MANUFACTURING COMPANY

J. FRANK STACEY, Pres. & Gen. Mgr.
GEO. H. CRESSLER, Gen. Sales Mgr.

T. C. RANSHAW Vice-Pres.
W. D. BIRBECK, Sales Engr.
A. E. HARVEY, Sales Engr.

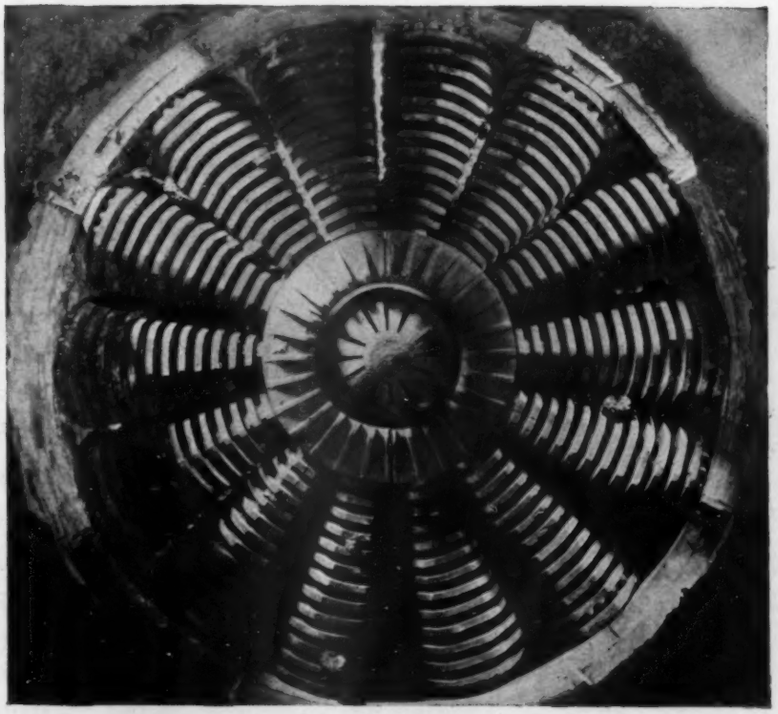
EDW. J. BAECHLE, Sec'y & Treas.
FRANK O. PANDORF, Chief Engr.

Established 1851 CINCINNATI, OHIO *Incorporated 1880*

New York Office: 52 Vanderbilt Ave. Telephone Vanderbilt 1549

Daily Clinkering Eliminated

The Steere Automatic Grate for Water Gas Machines



Continuous operation of water gas machines has been achieved.

The Semet-Solvay Engineering Corporation announces the Steere Automatic Grate for water gas generators.

Intermittent revolving grate action mechanically removes the ash and clinker broken up by the Grate Poker. No clinker accumulates over the grate, thus keeping the entire fire bed clean and open.

Operation of the Steere Automatic Grate is hydraulic. Design is simple and construction sturdy. It opens the way for new production records in water gas output.

The Grate is made up of rotating, conical-shaped segments. It can be installed on any water gas generator.

SEMET-SOLVAY
ENGINEERING CORPORATION
Division Allied Chemical and Dye Corp.
40 RECTOR ST. NEW YORK

45 Years of Progress

1882 1927

Forty-five years of progress and a
complishment stand back of t
U. G. I. organization, forming
background for the service it h
rendered the gas industry.

With far-sighted vision and jud
ment it has always led the way t
ward perfecting the art and raisi
the process and operating standar
from the low level of the old g
house to the present efficient ge
erating or carbonizing plant.

In addition to developing and int
ducing practically every importa
device and improvement used in t
carburetted water gas industry
day, U. G. I. research work h
benefited the industry far more
value than dollars and cents can r
resent.

OUR HOME

Under one roof, in this splendid structure comprising 430,000 square feet of area, the entire space is devoted exclusively to the uses of the U. G. I. organization.

**We would be pleased
to see you in Booth 91
at the A. G. A.
Convention**

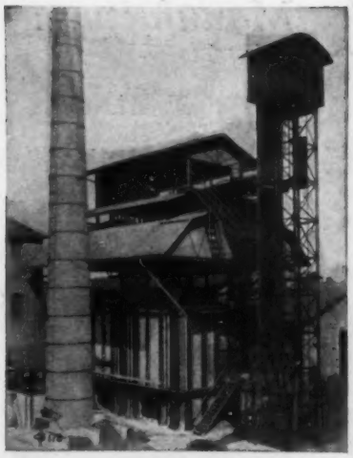
The U-G-I-CONTRA
421 Peoples Gas Building, Chicago — BROAD & ARCH STS PH

...and Accomplishment.

The U. G. I. has engineered, designed and installed about 1,100 sets of carburetted water gas apparatus with a daily capacity in excess of 1,250,000,000 cu. ft., or 450,000,000,000 cu. ft. per annum, if they were all operating; also 141 waste heat boilers for the conservation of sensible heat from water gas apparatus and carbonizing plants; 237 automatic controls for the efficient operation of water gas apparatus; 30 installations of Cottrell Electrical Tar Precipitators, and 42 Pier Processes for soft coal operation—both improved developments of a comparatively recent date.

The new U. G. I. Intermittent-Chamber Ovens are now being introduced, with the first installation being made for the Key City Gas Company, at Dubuque, Ia.

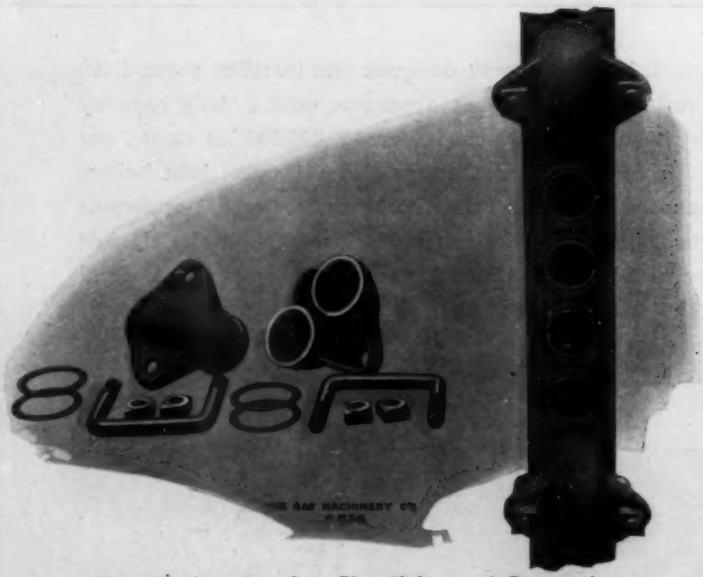
The U. G. I. Contracting Company activities are by no means limited to work within the gas industry. There are distributed from New England to Texas monuments to its engineering skill and construction ability in the form of Locks and Dams, Hydro Electric Stations, Steam Power Stations, Bridges and Viaducts, Industrial Buildings, High Tension Lines and other varied works.



...CTING COMPANY

...STS PHILADELPHIA — 1419 Healey Building, Atlanta

Complete Gas Plants



End details, showing Simplicity and Strength

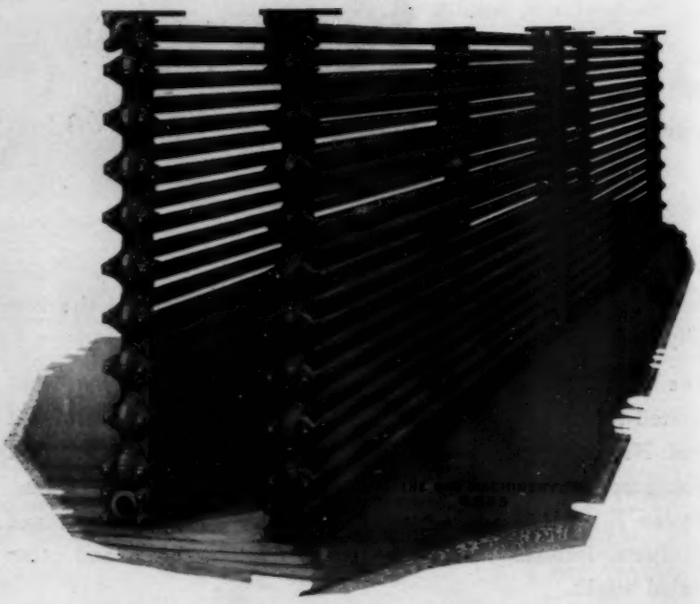
COOLING COILS

With 2-inch Tubes

Patent Pending

We also Design and Manufacture:

BENCHES,
BY-PRODUCT GAS OVENS,
PURIFIERS,
AMMONIA CONCENTRATORS,
TAR EXTRACTORS,
VALVES AND CONNECTIONS,
WASHERS



Assembled Coils—Full area of pipe in bends.
Built 20 to 40 Tubes high.

THE GAS MACHINERY COMPAN

- - Special Machinery

GAS OVENS

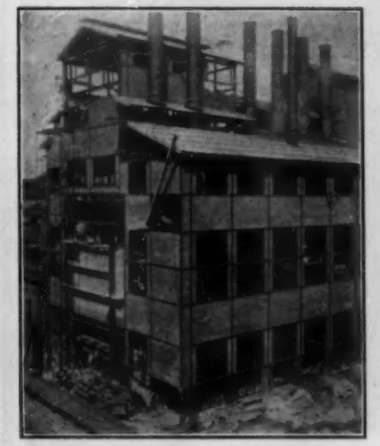
View to right shows Top of Oven Battery

This view shows the Pusher Side of Ovens

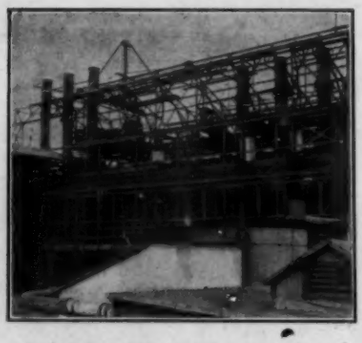
You will find a Hearty Welcome in Booth 28 Basement

- - - - CLEVELAND, OHIO

GLOVER-WEST
Vertical Retorts



PAWTUCKET, R. I. (Ext.).
1,060,000 cu. ft. per day.



SPRINGFIELD, MASS. (Ext.).
2,500,000 cu. ft. per day.

SOME OF THE GLOVER-WEST PLANTS NOW BEING BUILT

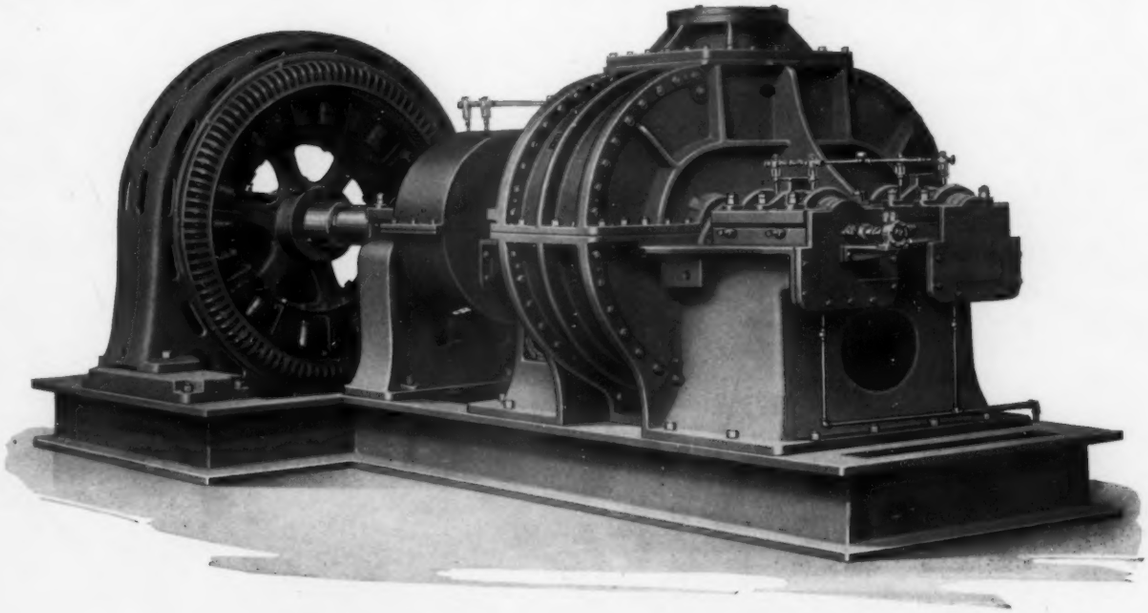
FARIBAULT, MINN.
400,000 cu. ft. per day.

VISIT BOOTH No. 82
A. G. A. Convention

NATURAL GAS PLUS MANUFACTURED GAS

The Glover-West system of coal carbonization is peculiarly well adapted to such conditions where the addition of plant for the making of gas from coal has become necessary due to lessening supply of the natural product. By the continuous steaming of the retort charge gas of any desired calorific value within wide limits may be made, and can be readily varied from time to time as the natural product become less available. Glover-West retorts get the utmost out of the coal and give a constant volume of gas from hour to hour of constant quality.

WEST GAS IMPROVEMENT CO.
Builders of Coal Gas Plants
441 Lexington Ave. New York.



Correct Proportion Means Reliability

300,000 cubic feet per hour against 10 lbs. pressure is the load on this Connersville Gas Booster.

The strength to take care of these higher pressures is not gained through the twenty-two tons of iron, steel and other materials which are in the motor and gas pump, but through proportioning the parts, so each carries its share of the burden without being overloaded.

In the booster, for example, the unsupported shaft and impeller length is reduced in proportion to the increase in pressure, holding the bearing load at a fixed conservative limit. So it is also, with the size of shafting, the adjustable quarter-box bearings and the ribs that strengthen the larger castings. The relative size of each is determined by the duty it must perform.

This is shown in more detail in Catalog 22

The Connersville Blower Company

12th St. and Columbia Ave.

Connersville, Indiana

Sales Offices

114 Liberty St.
New York

Chamber of Commerce Bldg.,
Pittsburgh

New England Representatives
Eastern Service Co., Boston

623 Monadnock Block
CHICAGO

CONNERSVILLE

Blowers • Gas Pumps • Meters • Cycloidal Pumps

"SAND-SPUN"

(Trade-Mark)

CAST IRON PIPE

Has Established Its Own Reputation

When "SAND-SPUN" Pipe was placed on the market it was a long step forward in making perfect pipe for the gas industry.

This "buried capital" is unseen for years at a time and the reputation of the pipe and its makers has much to do in the ultimate cost and efficiency of the pipe line and the profits on the send out.

"SAND-SPUN" PIPE —*Has Proved Itself!*

Our Exhibit and Representatives will be at
BOOTH 36
Grand Ballroom A. G. A. Convention

For High Pressures

Cast centrifugally in sand-lined molds, the result produced is pipe that is as flawless as it is possible to make. It is dense, fine grained, free from impurities and inclusions and yet soft enough to drill, chip or cut easily. It is tough, resilient and high in tensile strength.

Adaptable for use as plain tubes with any standard coupling

The Best Pipe Made

R. D. WOOD & CO.

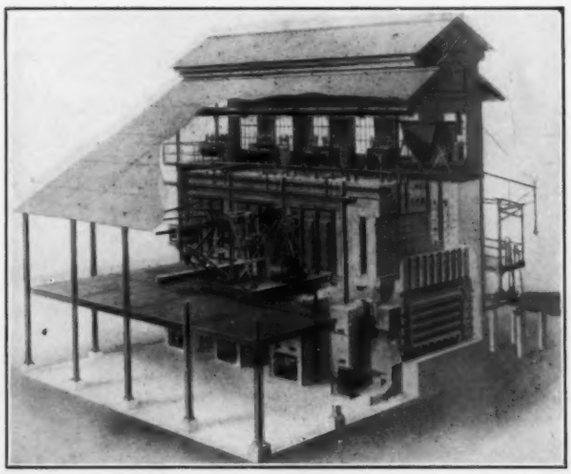
400 Chestnut Street **Philadelphia**

1803—ESTABLISHED 124 YEARS—1927

Durability—Efficiency—Economy

"IECO" *Modern Coal Carbonizing Plants*

"IMPROVED" Horizontal Gas Ovens



"IMPROVED" Horizontal Gas Ovens are rapidly winning favor in the plant of medium sendout—a fact readily explained when a unit consistently surpasses in performance the expectation of its purchaser and the promises of the builder.

The illustration shows plant of ½ million cu. ft. daily capacity IMPROVED TYPE HORIZONTAL GAS OVENS, featuring high yields of gas, coke, tar and ammonia of uniform and superior quality. Long, efficient operating life, low maintenance costs, minimum labor requirements and moderate initial investment.

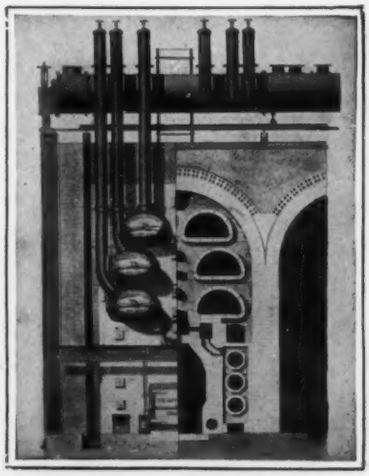
DOHERTY Economizer Coal Gas Benches

STOP-ENDS, THROUGHS AND INCLINED TYPES

If your benches are not DOHERTY FUEL ECONOMIZER BENCHES—compare what you have with the DOHERTY bench.

The long life of the Doherty Economizer benches—the freedom from expensive time-taking repairs—has been the object of much comment among gas engineers throughout the country. The reason for this record is no secret—it is the result of experience of years in the design, manufacture and building of equipment to meet the exacting needs of the gas industry.

Don't fail to see the complete layout of Unit-Type Horizontal Gas Ovens as installed at Albion, Michigan—BOOTH 30—Ballroom.



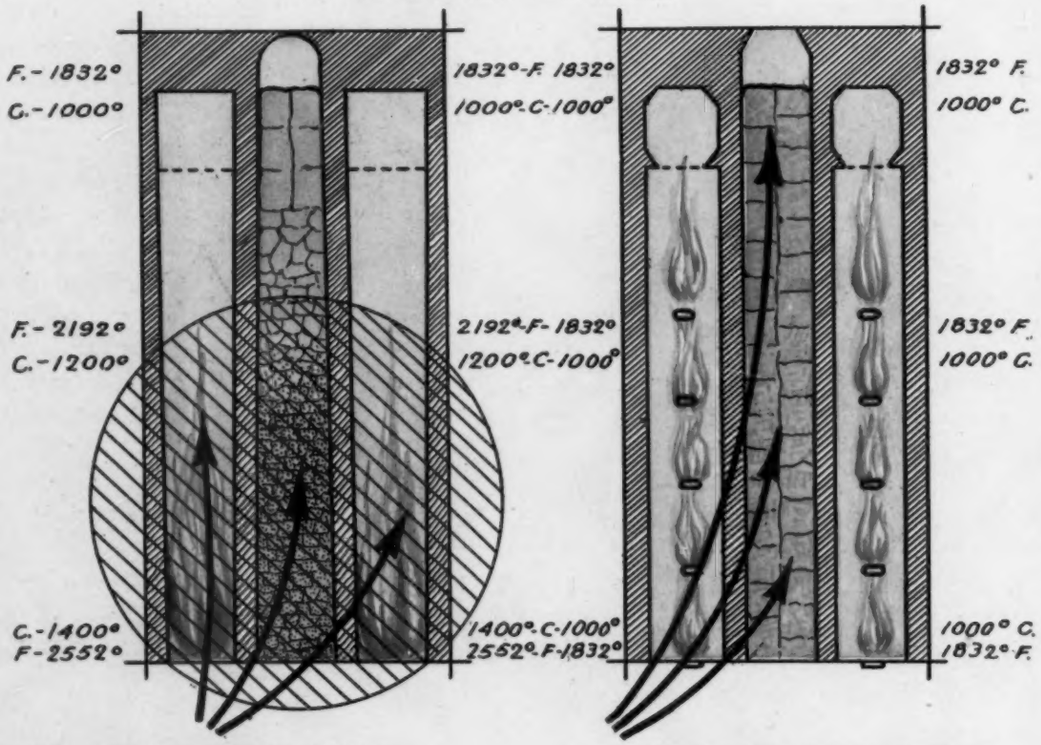
THE IMPROVED EQUIPMENT COMPANY

24 STATE STREET *Engineers - Builders* NEW YORK CITY

THE PROOF!

Showing the Efficiency of the STILL SYSTEM of MULTI-STAGE COMBUSTION

The demonstration plant, as indicated below, has been in operation for the past six months and is 19 feet 8 inches high



THE COMMON ONE-FLAME METHOD

Note how combustion is practically limited to lower 5′ to 6′ 6″, and only occasional tips of flame reach 7′ 6″.

—and then—

THE CARL STILL MULTI-STAGE COMBUSTION SYSTEM

Note how in the Still System the heating gas is stretched over the entire height of the heating flue—19′ 8″.

Furthermore—A 40% throttling of the volume of heating gas did not in the least affect the uniformity of the Still System, while the one-flame process was confined to parts in the immediate vicinity of the sole of the flue.

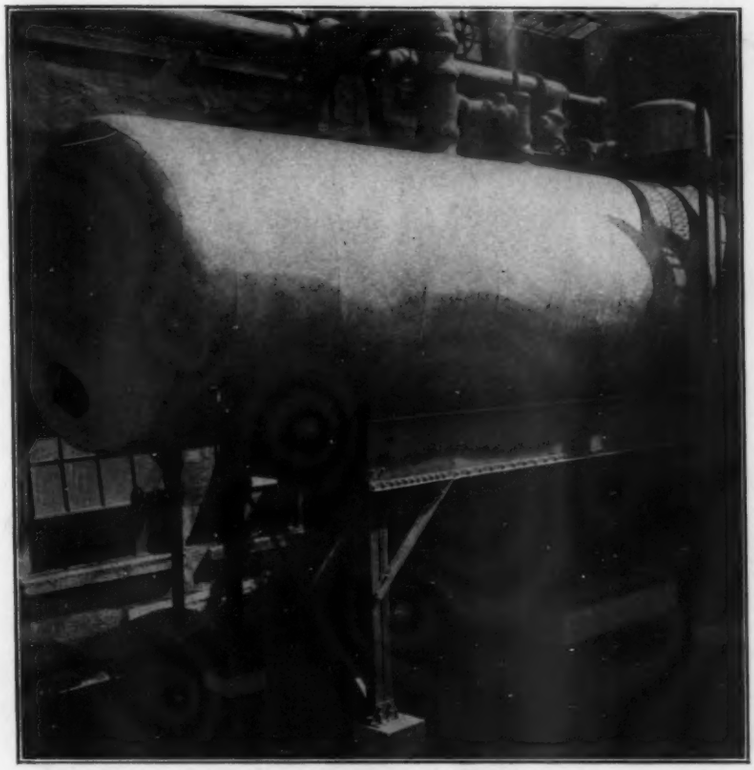
Other strong points of the Still System are:
Excessive Heating eliminated. Utmost protection of Distillation Gases. Highest yield in By-products, and Free Flowing Tar. Fastest operation of ovens and largest possible thruput. Lowest consumption of fuel gas. Unlimited oven height. Maximum safety and minimum labor requirements in operation. Greatest efficiency.

Let our Consulting Engineers give further details

CARL STILL CORPORATION

114 LIBERTY STREET, NEW YORK

SMOOT STEAM ACCUMULATOR



Smoot Steam Accumulator, Long Island Lighting Co., Bay Shore, L. I.

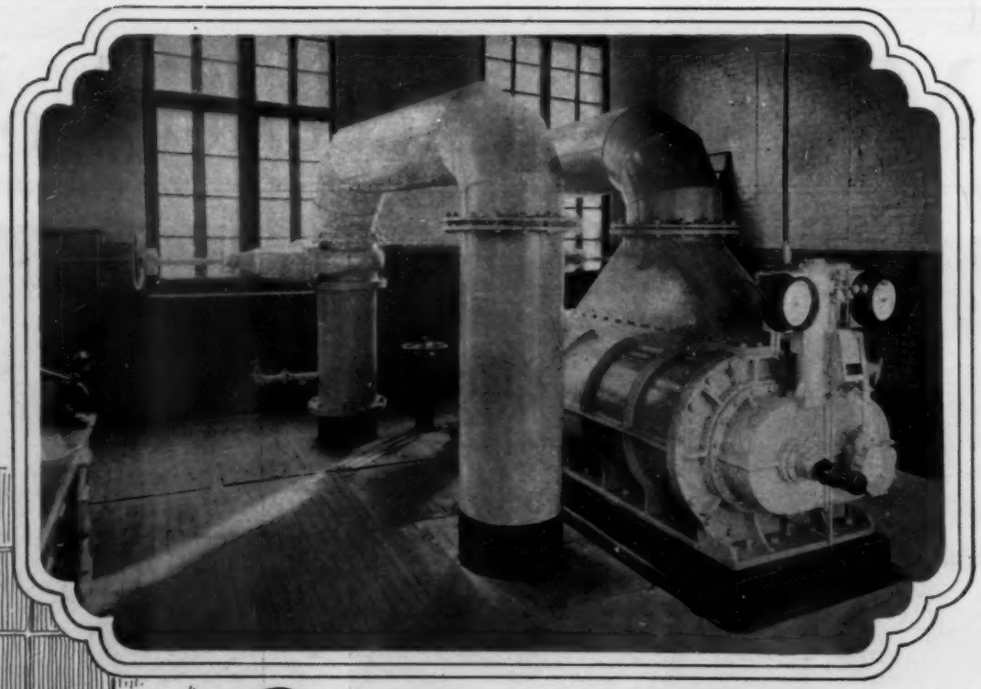
E. L. PHILLIPS & CO., PLANTS INSTALL

SMOOT STEAM ACCUMULATORS

Long Island Lighting Co. - - - - Bay Shore, L. I., N. Y.
Nassau & Suffolk Lighting Co. - - Hempstead, L. I., N. Y.
Queensboro Gas & Electric Co. - Far Rockaway, L. I., N. Y.

SMOOT ENGINEERING CORPORATION
136 Liberty Street New York

SMOOT CONTROL



Extreme Accuracy

The capacity of each Roots Meter that leaves our plant is checked in our own laboratory and the volume as shown by the Roots Direct Reading Volume Integrator is corrected to give accurate results.

Refinements in design, highly accurate machining and careful erecting have reduced the percent of error in Roots Positive Displacement Meters to an amount that comes well within the accepted variations of other types of machines.

Let your next meter be a Roots for Roots Meters eliminate all guesswork on the sendout or make.

The P. H. & F. M. ROOTS CO.

CHICAGO Peoples Gas Building • CONNERSVILLE, INDIANA • NEW YORK 120 Liberty Street

ROOTS

Kreicker

METAL TO METAL

GAS HOLDERS

EVERY INCH CALKED AS ASSEMBLED

TANKS

PURIFIERS

STEEL PLATE WORK

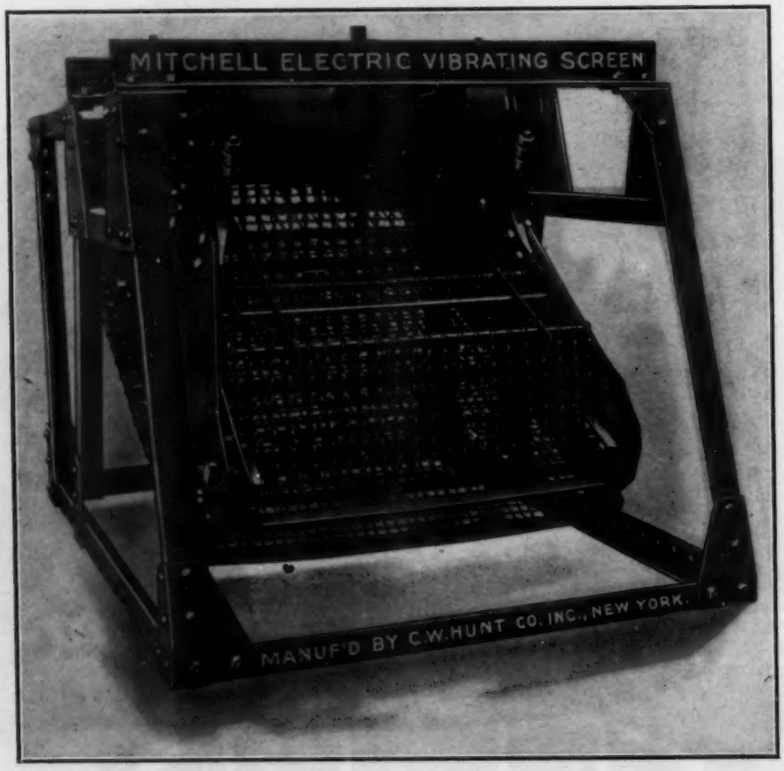
C-K CO PRODUCTS

Hurricane at Key West
Tornado at San Juan
Flood at Pittsburgh
Fire at Norfolk
Hurricane at Miami

All Standard Holders
Sure they stood up
Designed right

CRUSE-KEMPER Co

Western Union Code Ambler, Pa. "CRUSKEMPER"



You Saw this Mitchell Screen at Atlantic City Last Year!

HUNT

WE DESIGN AND BUILD:
Industrial Railways, Automatic Railways, Cable Railways, Cars, Tracks, Switches, Motor Cars, Scales, Conveyors, Skip Hoists, Electric Vibrating Screens, Cut-off Valves, or Gates, Weighing and Measuring Devices, Coal Crackers, "Stevedore" Transmission Rope and Hoisting Rope, and the "Flotograv" (Coke Reclamation System).

This is the Screen that caused such favorable comment from Gas Engineers who watched it operate at *60 times a second without vibration.*

The Mitchell Sizing Screen is unequalled for accurately and rapidly sizing coke and coal. The illustration shows a No. 77 Standard Double Deck Type equipped with four rows of chain baffles to regulate flow of material over screen surface. Screens consist of square mesh or perforated metal plates. Average capacity, 45 tons per hour. Only 7/10 of a horse power required to operate.

We regret our inability to secure sufficient space to properly exhibit them, will preclude our showing the Mitchell Screens at the Chicago Convention. However, you can have full information on request.

C. W. HUNT COMPANY, Inc.

West New Brighton, Staten Island, New York

PHILLIPS LANG & CO., Inc.
431 S. Dearborn St., Chicago, Ill.

ENGINEERING EQUIPMENT CO., Ltd.,
358 Beaver Hall Square, Montreal.

ERNEST F. LEARNED
141 Milk St., Boston 9, Mass.

RECOGNIZED LEADERSHIP

THE dominant idea that underlies the production of REYNOLDS GAS REGULATORS at the factory has created recognized leadership.

The Reynolds idea demands that high standards be raised higher. So, Reynolds refuses to rest on accomplishment. Reynolds engineers are ever searching for refinements and improvements.

Constant improvements have paved the way for Reynolds present enviable position. The new MODEL 10 SERIES has swept the industry—it will be on display in Booth No. 15 at the American Gas Convention.

With or Without Mercury Seal
in either Dead Weight or Spring Type Adjustment

Reynolds
Gas Regulator Company
Anderson, Indiana
Established 1892

New England Representative: EASTERN SERVICE CO., Boston, Mass.

See the New
MODEL 10 SERIES

at Booth No. 15
American Gas Convention

October 10 to 14
inclusive
Hotel Stevens

Reynolds Products
for all kinds of Pressure Reduction —for either artificial or natural gas.

Governors—
- Intermediate Pressure
- Triple Outlet
- Holder
- Toggle Type Street

Regulators—
- High Pressure Service
- Low Pressure Service
- Intermediate Pressure
- High Pressure Line
- Single and Double District Station

Valve—
- Automatic Quick-Closing Anti-Vacuum

STREET DEPARTMENT SUPPLIES

Used since 1897

GOODMAN STOPPER
Reg. U. S. Patent Office

Locking Sleeve

Goodman Stopper

The Goodman Stopper has been used and endorsed by the leading Gas Companies of the United States since 1897, and is now being used in most of the foreign countries as well.

It is RELIABLE because its shut-off is positive and when properly inserted it cannot collapse.

GOODMAN STOPPERS locked in the pipe make the shut-off safe.

GOODMAN CYLINDRICAL STOPPER

Patents Pending

Gas Main Bags

Built in Three Types: A, B and C

This is an inflatable bag with a fine strong waterproofed casing for use in gas, oil, water and drain pipes. It may be inflated to a high internal pressure and will shut off higher pressures than can be shut off by other bags or stoppers.

Don't Fail to Visit Booth No. 77 in the Basement—Stevens Hotel

PIPE GANG TOOLS

SAFETY GAS MAIN STOPPER CO.

523 Atlantic Avenue BROOKLYN, NEW YORK

Cable Address: Gastopper, N. Y.

GROBLE
REGULATORS & GOVERNORS

ANNOUNCING

The Groble District Station Regulator that automatically increases and decreases the outlet pressure according to demand.

It's new!
It's sensitive!
It's dependable!

See it on display for the first time at the American Gas Association Convention and Exhibition to be held October 10 to 14 at Chicago at the Stevens Hotel.

See demonstration at

BOOTH 93

GROBLE GAS REGULATOR CO.

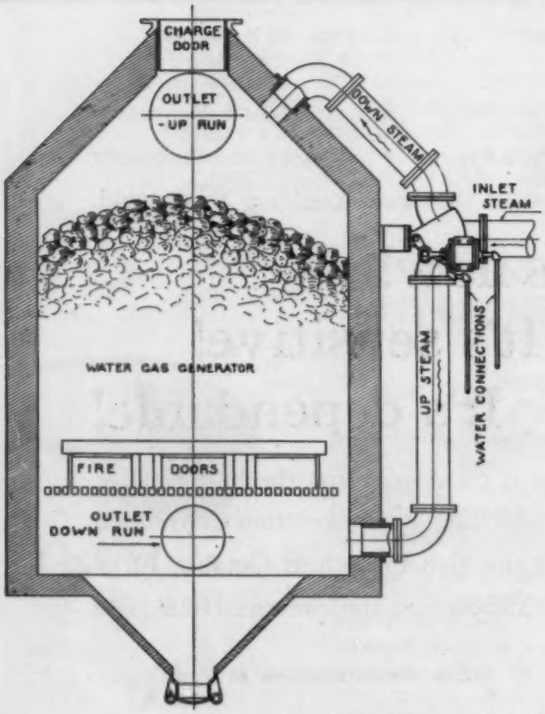
ANDERSON, INDIANA

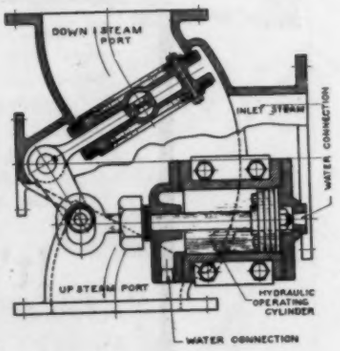
Chicago Representative—Utilities Service Co., Peoples Gas Building.
Detroit Representative—H. E. Broughton, 409 Donovan Building.

B. H. CO.

STEAM REVERSING VALVE

FOR WATER GAS SETS





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AMERICAN
GAS JOURNAL
Established 1859 Pioneer of the Gas Industry
Including GAS INDUSTRY Est. 1900.

HENRY M. RILEY, *Editor*

Professional Inspiration from Conventions

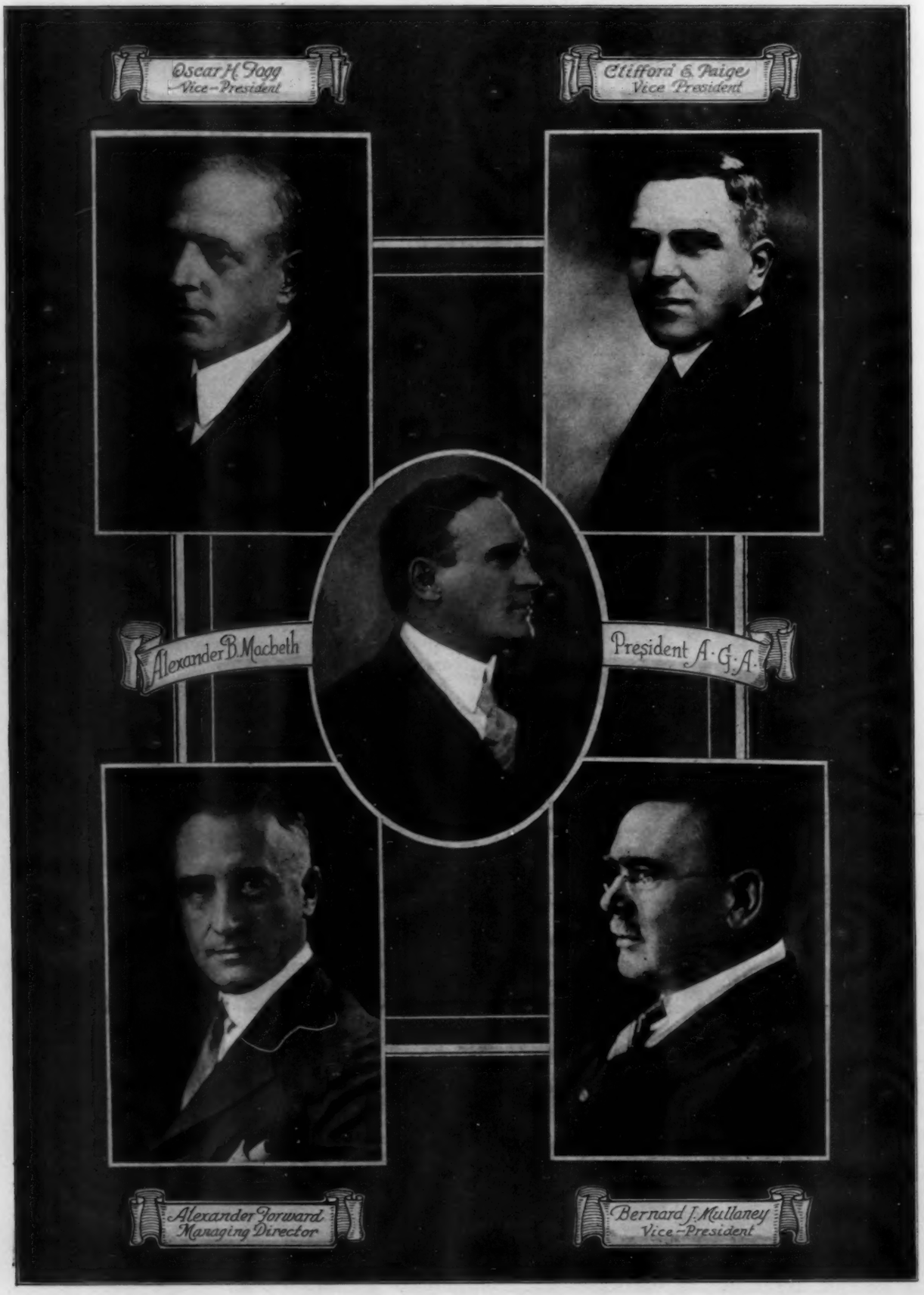
ATTENDANCE at the American Gas Association meeting in Chicago is essential for any ambitious individual connected with the gas industry if it is at all feasible for him to leave his regular duties during convention week. It is not well for a man to live too much to himself. And in the gas business we find no exception to this rule. The stimulus to clear and progressive thinking which comes from association with fellow workers in the industry for a few days each year cannot be over-estimated.

SOME MANAGEMENTS do not seem to understand this situation. They feel that their organization can be quite satisfactorily served if they are supplied with the printed proceedings of the association or with an occasional reprint of an important paper or committee report. Such managements clearly do not realize that we must learn by conversation and by viewing the exhibits just as much as by reading the reports and technical articles.

An expenditure of a few hundred dollars to send key men from each organization to attend a day or two of the convention proceedings will be money well invested. One single idea gained from a chance contact in the corridor groups may directly repay the local company manifold for this expense. And the renewed enthusiasm and aggressiveness in the day-to-day jobs will be an indirect compensation that, though intangible and difficult to estimate, may be even greater than the direct savings.

AT NO TIME has the industry more needed aggressive independent thinking on management, technical and merchandising problems. The industry is being remade; and those companies which keep up in the strenuous pace demanded must have not one, but many, workers in touch with the latest and best for their part of the business of the day.

A RECORD-BREAKING attendance and unprecedented enthusiasm should be recorded at the Chicago meeting, the first to be held in the Middle West for several years.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Looking Back on the Convention City's Gas Industry

By Felix B. Streyckmans

The Peoples Gas Light and Coke Company

WHEN the gas men of the nation visited Chicago for their annual convention six years ago, the city and its gas company had just entered a new era of progress and modernity. When the gas men of the nation visit Chicago this month, they will see a greater community and a better gas company.

Chicago had begun to build in 1921 on a plan destined to change it from merely a large and prosperous city to the most beautiful center of commerce and habitation in the world—and the Peoples Gas Light and Coke Company was just well started upon transformation of the organization from merely a large company, selling gas and striving to make money, to a happy, prosperous, efficient organization, giving a valuable public and industrial service.

Tangible Evidence

The last American Gas Association convention held in Chicago witnessed the bare beginnings of these two colossal undertakings. And now, only six years later, there is tangible evidence of a multitude of results already achieved.

Chicago's skyline has become more stately during the past few years and is notably more awe-inspiring than in 1921. At least ten of the city's huge buildings rank among the finest in the world, and all have been built during the last six years. Grant Park has been completely transformed since the country's gas men were last Chicago's guests, the Illinois Central suburban railroad has been electrified and State Street has become the most brilliantly lighted street in the world.

Although the earlier history of the Peoples Gas Light and Coke Company must be prosaic in the present telling, chronicling pioneer events in Chicago gas service is an essential preliminary for comparing recent progress.

"The West Window," Employees' Vacation Resort Building

The first boat had not yet come up the Illinois-Michigan Canal when, on October 16, 1848, the application was drawn up for presentation to the Illinois Legislature by which Chicago was given a gas service that has now continued without interruption for seventy-seven years. On August 28, 1850, after the necessary construction had been completed, the manufacture of gas began. On the afternoon of September 4, 1850, the required 60,000 cubic feet were in the holder and the gas was let into the mains to clear the air from the pipes. Many enthusiastic customers could not wait for darkness to fall to witness the new phenomenon and shops were lighted before dusk. Night came and Chicago reveled in a brilliance that then was dazzling.

A New Era

The "Gem of the Prairie," forerunner of the Chicago "Tribune," said: "Wednesday marked a new era in Chicago. At about 2 o'clock P. M. the gas pipes were filled and brilliant torches flamed on both sides of Lake Street as far as the eye could see, and wherever the posts were set.

"* * * In the evening the lamps were again lighted, and for the first time in the history of Chicago several of the streets were illuminated in regular city style. Hereafter she will not 'hide her light under a bushel.'"

And she never did! On Otober 14, 1926, over 250,000 persons gathered on State Street to witness the inauguration of the brightest street lighting system in the world—two and one-half times brighter than the best previous street illumination.

Chicago's first gas company was the Chicago Gas Light and Coke Company. It served 125 private customers, 36 lights on the city hall, then Chicago's only public building, and 99 street lamps. Consumption began at the rate of 15,000 cubic feet nightly. Within a month there was a daily consumption of

22,000 cubic feet and by the end of the first year 8,030,000 cubic feet had been used.

In the first decade of Chicago gas service, the population increased 267 per cent, gas mains 960 per cent and consumers 1,500 per cent.

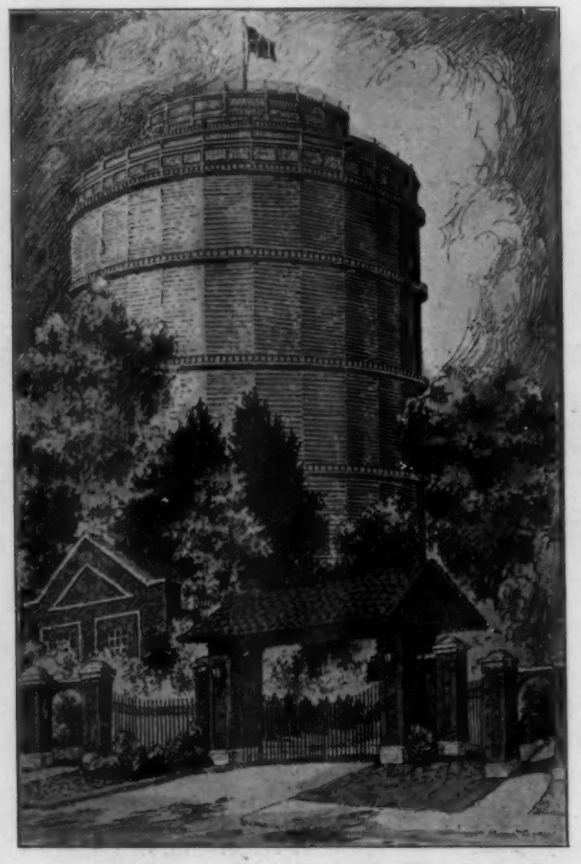
The Peoples Gas Light and Coke Company, the only survivor of many years of uneconomic competition, received its charter on February 12, 1855, but, because of difficulties in financing, did not begin manufacturing gas until June 1, 1862.

The two companies operated in separate districts and without competition until later years. The price of gas was raised to $3.00 per thousand on account of the Civil War and in 1865 was $4.25, including a twenty-five cent war tax. This is the highest rate Chicago ever had. By 1871 the older company had 175 miles of main.

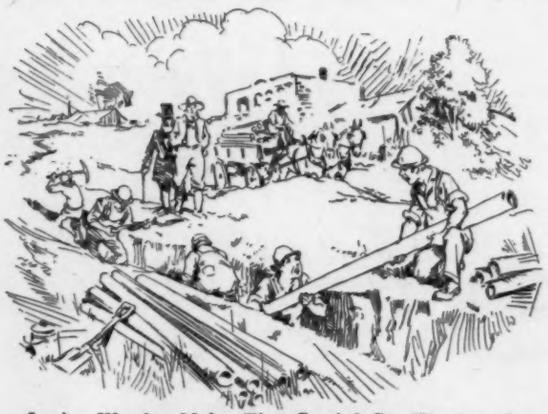
The Chicago Fire

Then, on October 9, 1871, the greatest fire modern civilization ever witnessed began to sweep the city. It raged for twenty-seven hours, destroying 18,000 buildings over an area of more than 1,688 acres. For every minute of this horrible conflagration an acre of ground and over $10,000 of property were devastated.

By almost superhuman effort the North Station was saved from the flames. Before the fire reached it the pumps were manned and the entire station, including a wooden shed containing the coal supply, was kept under steady streams of water. The station stood, serviceable, after the flames had passed, and every other building to the north, south and east had been destroyed. Leakages were stopped among the ruins of the burnt district and the few remaining houses were given service immediately.



15,000,000 *Cubic Feet Waterless Holder With Proposed Landscaping*



Laying Wooden Mains That Carried Gas Through the Streets of Chicago in 1850

The work of rehabilitation began. Five miles of mains were laid by the Chicago company in 1872 and a new station operated in 1874. Work was begun on another station to supply the rapidly growing southwest side. The business of the Peoples Company increased steadily and a works at Division Street, still in service, was completed in 1881.

Ruinous Competition

The ensuing sixteen years were a nightmare of ruinous competition. Eighteen companies were formed in the territory that is now Chicago before the People's Company was given an opportunity of settling down to a basis by which rates might be established that were fair to both customer and utility.

The Hyde Park Gas Company had been formed in 1871. In 1881 the Consumers Gas Fuel and Light Company, Lake Gas Company and Northwestern Gas Works Company came into the field; the Suburban Gas Company, 1884; the Equitable Gas Light and Fuel Company, Illinois Light, Heat and Power Company and Calumet Gas Company, 1885; and the Consumers Gas, Fuel and Light Company in 1886.

The Consumers Gas Fuel and Light Company started the melee with a rate of $1.75 per thousand cubic feet and a rebate of twenty-five cents to large volume users. The Peoples Company went down to $1.50. The Chicago Company reduced its price to $1.25 per thousand in 1883.

As an outcome of this competition, novel devices for home-cooking, such as hot plates and nursery burners, were given to attract or hold customers. There was no thought that these additional appliances might increase output without increasing meters.

Chicago Business District As It Appeared When First Lighted By Gas in 1850

In 1886 the Chicago Company invaded the Peoples' territory on the West Side. Then, in 1887, the Chicago Gas Trust Company was organized to consolidate the eight companies under one head. A controlling interest in all of them was acquired, the consolidating company operating under a trust agreement. But consolidation was contrary to public favor—"trust-busting" was then the vogue. The economic advantages to the consolidating parties and the economies made available to the consumers by merging had never been demonstrated, and there was no means of reaching public opinion. As a consequence, general consolidation was blocked and the courts frustrated every expedient that legal minds could devise for the next ten years to bring it about.

Other Companies Enter Field

To add to the maze of mains then burdening the community, the Mutual Fuel Gas Company was incorporated in 1889. The Chicago Economic Fuel Gas Company began operations in 1890. What was reputed to be the largest gas factory in the history of the industry, having a capacity of 12,000,000 cubic feet, was built by the Universal Gas Company, which was incorporated four years later, and its product was distributed by the Mutual Company. In the following year the Ogden Gas Company, one of the most powerful of the new competitors and the longest survivor against the Peoples Company, was given a fifty-year charter. This company bound itself to sell gas at ten cents below the existing rate of $1.00.

Then, under an enabling act passed in 1897 and in the same year, the Peoples Gas Light and Coke Company absorbed its predecessor, the Chicago Gas Light and Coke Company, and all others in Chicago except three. It took over the Mutual Fuel Gas Company and the Calumet Gas Company the following year, and in 1900 the Ogden Gas Company was taken in. Thus did competition cease.

The Peoples Gas Light and Coke Company began to breathe more easily back in 1897, however, after the first consolidation, when it assumed the responsibilities of the modern conception of a public utility. During its forty-two years of previous existence as a competing company it had laid 1,320 miles of mains, had 162,000 meters in use and was serving 29,000 street lamps.

Early Sales Record

Although the mention of gas for heat was first shown in Chicago, gas history by the use of the word "fuel" in the incorporated name of the Consumers Gas Fuel and Light Company in 1886, no special effort was exerted to develop this new type of load. Only a little over 20,000 stoves had been sold in Chicago up until December 31, 1898, under a sales "activity" that consisted of not much more than allowing the public to buy the stoves if it wanted them. This attitude was destined to be reversed at this time, however, and in a manner quite at variance with the well-formulated sales plans of present company practice.

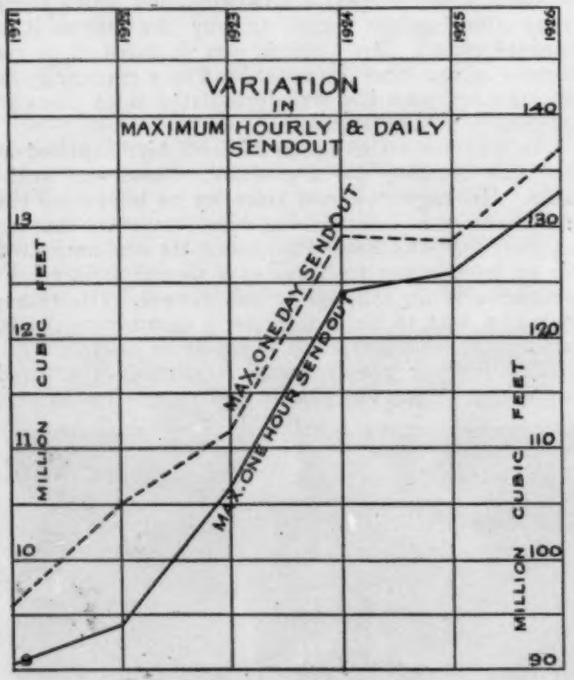
An ambitious Chicagoan of Irish birth applied at the gas company for a position. None was available. His eagerness and sincerity so impressed the man who was interviewing him, however, that an opportunity was created for him. He was permitted to go from house to house as a special sales representative in an attempt to sell ranges. His remuneration was to be strictly on a commission basis, amounting to a dollar for every stove sold.

This pioneer gas-appliance merchandiser secured a horse and wagon, placed two ranges on it, pla-

The Gas Company of Chicago Now Serves a Mighty Metropolis. Pure Oil Building

carded his vehicle with advertising "copy" written in a multitude of languages, and drove westward to the district inhabited by Chicago's foreign-born.

When he reached a busy street intersection he pulled up alongside a lamppost, disconnected the lighting "tip" and attached a hose from one of his ranges to the outlet and lighted the stove. Then, with much ballyhooing and appropriate gestures, he attracted a large throng of housewives. He extolled the virtues of his wares with great eloquence, although it was doubtful that his words were understood. Sincerity, eagerness and enthusiasm being the same in every language, however, his listeners believed in what he was telling them, although not knowing very clearly what it was.



A Steady Growth in Sendout

Next he placed his hands above the burners and within the oven and invited his audience to do likewise. A line was formed and one by one his prospects felt the heat. Another line was formed and orders were signed for delivery of the new cooking medium. He turned in orders at the company offices faster than they could be filled. Thus did the local gas industry learn that definite sales effort in the domestic cooking field could develop an extremely worthwhile load and that customers could be taught to accept a domestic convenience without waiting for public favor to develop itself. The cooking load more than compensated the increasing losses of the illuminating load in ensuing years.

Banishment of Political Harassment

The two decades following the consolidation of 1897 were taken up by the usual readjustments, but the outstanding work of the period was the liberation of the company from political harassment, regulatory interference and illogical rate-making.

The State Legislature passed an act in 1905 which pretended to give the City Council the right to establish rates, but the validity of it was questioned and it was eventually declared invalid. The city authorities acted under it in 1911, however, and fixed the price of gas for the next five years. The new rates were to be 75 cents for the first year, 70 cents for the second and third and 68 cents for the fourth and fifth.

The company appealed to the courts in defense against this confiscatory rate schedule and the court established a rate of 80 cents. This produced a maze of litigation and relations between the company and the city and between the customers and the company were strained as a result of it. Meanwhile the State Public Utilities Commission was created in 1913 and rate-making then came entirely under its jurisdiction. But the city authorities, jealous, perhaps, in seeing powers taken from them, resisted and, by implication, denied the superiority of the commission over the council as a regulatory body.

Agreements With City Sought

Because the city was not in sympathy with State control, the gas company attempted to avoid further friction by seeking agreements with the city before approaching the commission in the future. But frustration of the city's desires to force a low rate was not easily forgotten, and a series of unfortunate circumstances soon to come made the Peoples Company pay almost with its life's blood.

When the incandescent mantle light and the increase in the cooking load made the candlepower value of gas negligible and calorific content dominant, the company sought to lower the illuminating value. In pursuing its friendly policy of consulting the city before petitioning the commission, the company sought an agreement with the city council for changing the standard. But the city did not act and the company was forced to continue making a high candlepower gas for two and one-half years more.

The public, as a spectator, knew little about what the gas company wanted except that "something was to be taken from the gas." Suspicion and unfriendliness were added to a public attitude which had already been unfavorably influenced by the rate litigation of preceding years.

Difficulties Attending Belated Relief

Permission was finally obtained in June of 1917 for lowering the candlepower requirement, but this was too late to prevent financial difficulties and serious collateral consequences. Wages could not be increased while the cost of manufacturing gas was mounting and net income declining. The United States was in the war. Labor was at a premium and wages were being raised throughout all industry. But not in the Chicago gas company. Many of the best in its organization were enticed away to other industries. Inferior help had to be hired and hastily

trained. Errors began to creep into the monthly bills. When all about them doing comparable work were receiving more money, gas company employes were looking around for better opportunities and had their minds on making a change.

Still having in mind the rate and candlepower differences of the past, the public had no patience or charity toward the company in its predicament. Erroneous bills were believed to be the denouement of an insidious campaign of banditry.

Clamor for Adjustments

Customers clamored at the offices for adjustments in their bills faster than they could be made by the crippled personnel. Only one and one-half per cent of the 8,000,000 bills sent out in 1918 were incorrect, but this was enough to cause dissension. Customers who could not get adjustments promptly deferred their payments and the temporary loss to the company from this source, added to other losses, was $1,346,769.20 in 1917 and $2,218,233.69 in 1918. The net earnings began to fall in 1915—the year that relief from the candlepower standard was delayed—and deficits were incurred amounting to $365,201.35 in 1917, without allowing dividends, and $1,366,628.54 in 1918. The dividend rate of 8 per cent was reduced to 6 per cent in 1916 and to 4 per cent in May of 1917. After August of the same year dividends ceased entirely. A rate adjustment was absolutely essential. But the commission was reluctant to grant an increase in the face of public hostility. The company was forced to operate at a loss that finally reached $10,000 a day and continued at that rate for a considerable period.

The Wolf At the Door

When the new regime took over the situation—a force that was to bring about an almost miraculous resurrection and inaugurate the policies which resulted in complete reversal of the company's position—an enraged public, the sheriff and the wolf were at its door.

In February, 1919, there was a change in administration under which the first efforts to restore the company's assets were directed toward what it believed—and still believes—is any utility's greatest asset: the good-will of the community it serves. An adequate rate was the ultimate aim, but the foundation had to be laid with the public, so that the commission would not incur the disapproval of the people. The new management, maintaining that no company's public relations can be better than its industrial relations, commenced its good-will activities within the organization. A training and education division for employes was established during the first year of the new regime and a dean of women was appointed. Her duties consisted in complete supervision of the feminine personnel, including the employment of all women and giving advice when the advice of a woman was needed. Her office was made available for consultation. A supervisor of safety and fire prevention was also appointed. An error department, to systematically analyze all mistakes and formulate methods of avoiding them, was put into extensive operation.

Only a thousand dollars were available for advertising the first year, which was used to inform customers, through printed messages in their monthly bills, of changes in policy and service. Adjustments were made on bills that were declared to be erroneous without the extensive research which had caused delay and irritated customers. Satisfying the customer became the paramount aim. When the public became aware of the sincerity of this new attitude, results were shown on the books as well as in the acquisition of good-will—deferred payments became less numerous.

Since permanent alleviation was to come only through a better rate, attempts to increase income were made subservient to attaining a public favor that would withstand an increase. Time, effort and money were spent on training employes in the principles of giving good service, and energy was also directed toward awakening the public to a realization of service betterments. Personal calls were made on dissatisfied customers to inform them of the difficulties the company had been in and assure them that conditions were only temporary. Promises were made and they were kept.

Wage Increase Granted

A general 10 per cent increase in wages was granted in the latter part of the year. This helped employe morale and the personnel co-operated closely with the management in working toward creating the conditions that would permit another wage increase.

A rate reduction amounting to 4 per cent was ordered by the commission on June 19, 1919, but the company carried on. Public attitude was already becoming more friendly and activities were broadened to include institution of policies that would permit wider use of gas. Believing that the future expansion of the gas industry would come from increased use of its product for heat, an industrial department, to promote wide and varied use of gas in industry, and an architects' section, to encourage adequate piping and appliance outlets, were established.

Many operating efficiencies and economies were instituted during 1919, and there was a small net income for the year of $65,207.46.

Employe attitude had been so improved by the stimulus of the wage increase of the year before,

Year	Population of Chicago	Gas Sales in Cubic Feet	Customers Served
1921	2,767,516	26,758,528,000	684,932
1922	2,833,328	27,602,698,000	692,383
1923	2,886,121	29,791,111,000	708,411
1924	2,939,605	31,621,306,000	741,417
1925	2,995,239	32,500,782,000	765,354
1926	3,048,000	35,687,864,000	781,790

Keeping Step With the Population

Above—The Largest Battery of Gas-Fired Smoke Houses in the World. Over 50,000,000 Cubic Feet of Gas Are Used in the Chicago Stock Yards Every Month.

Right—The Chicago Company Has Adopted a New Slogan for a New Sales Activity and Several Chicago Churches Are Being Heated With Gas.

Above—Cutting Steel Billets With a Gas Flame.
Below—Annealing Manganese Steel Castings in a Carbottom Type Hearth Gas-Fired Furnace. A Dozen Large Chicago Companies Use Gas for This Process.

Above—Chicago's Famous Commission Market, Rebuilt Two Years Ago, Where 10,000,000 Cubic Feet of Gas Are Used Monthly for Ripening, Roasting, Singeing and Myriad Other Operations.
Below—The First Gas-Fired Soft-Metal Furnace Used in Chicago; Installed in 1907.

and with such a satisfactory effect upon the service given, that another 10 per cent increase was made early in 1920. Employes were given their first opportunity to participate in a savings and investment fund managed by employe-trustees in that year. This proved an excellent means of permitting employes to better themselves financially by group investment. The return on these funds, which are still in effect, has always been large and employe satisfaction with them has been high.

Improvement in Public Relations

Public relations continued to improve and relief was had from the stifling of inadequate income by a substantial rate increase granted in April, 1920.

During 1920 the net income increased to $380,752.02, compared with $65,207.46 for the year before.

Having passed the crisis during the two preceding years, the company set out, in 1921, to build the groundwork upon which its present good public and industrial relations are based. Systematic and intensive promotion of the use of gas in industry really dates from that year, also, when the industrial department was reorganized and a force of about thirty-five sales engineers added. It was in 1921 that the company acquired and gave to the gas industry throughout the world its well-known slogan, "If it's done with heat, you can do it better with gas."

In continuing to acquire loyalty from its workers, the management instituted an employes' representation plan, providing employes with the means of participating freely and fully in settling all company questions that concerned them. Among these were matters of pay and hours, working conditions and every other phase of industrial relations that might possibly arise between employer and employe. The plan is still flourishing and employe representatives are elected annually by the employes themselves and meet on the company's time. This plan has been a distinct contribution to good industrial relations.

Value of Employee Suggestions

To enlist the aid of the entire company personnel in improving service, methods of manufacture and distribution and in minimizing errors, a suggestion system was put in force the same year. Suggestions are welcomed and are paid for, if accepted, in cash. Over 4,000 suggestions have been offered to date, 437 of which have been incorporated into company practice.

In December of 1921 the first gift insurance, which is renewed annually, was presented to employes. Additional group insurance is made available to them by subscription.

Plans for employe aid were so great during the year that an industrial relations department, now under direction of one of the vice-presidents, was created.

Results were shown rapidly. Payment of dividends was resumed in January, 1922, at the rate of 5 per cent. The dividend rate became 6 per cent with the payments made in January, 1923; 7 per cent in January, 1924, and 8 per cent in January, 1925. It was possible to reduce the rates to all customers twice—in February, 1922, and August, 1923. The reduced general rate schedule of August, 1923, also established a special rate for househeating and inaugurated industrial contract rates, which were further readjusted in 1925, with a stimulating effect upon sales.

The public and industrial relations work begun in 1919 and expanded in 1921 is continued with the same energy and enthusiasm as when the problem was begun.

Vacation Resort Established

During the summer of 1923 the company acquired an interest, with other Chicago utility companies, in a vacation resort at a nearby lake. Over 200 acres of well-timbered land, nearly two miles of shore line, a hotel, cottages, camp sites and every facility for vacation sport and entertainment are available to employes, their families and friends, at nominal cost.

In 1925 the company awarded the first of its gold service emblems. These are given to all employes after they have been in continuous service for five years and a star is added to each pin for every additional five years of service. Over half the company's 4,000 employes are proudly wearing these "symbols of service."

Employe turnover among the office help has been reduced 60 per cent by this consistent industrial relations activity. Sons and daughters of present employes look forward to the time when they may "go to work for the gas company" and each year large numbers of them are added to the personnel. Switchboard operators who have left the company in recent years to take over the duties of making homes frequently call the company during periods of cold weather and other rush seasons to ask if they might come back temporarily "just to help."

Public relations effort is also increasing and is strengthening public regard. Opportunities for errors in bills are more numerous by far than they were in 1918—over 800,000 bills must be computed and collected monthly. There is an average of ten operations in making out each bill from reading the meter to delivery of the bill—more than 8,000,000 opportunities for making mistakes each month. The number of errors which actually occur is only about seven one-thousandths of 1 per cent.

Immensity of Telephone Communication

More than 2,000,000 telephone conversations were carried on between the company and the public last year—7,000 per day. Over 28,000,000 other personal contacts between employes and customers occurred. Each one of these contacts is an opportunity for enhancing public friendliness and is treated as such.

The home service department, established in 1922, is an outstanding example of the company's attitude of service above selling. This department promotes the intelligent preparation of foods and instructs in general home-making. It functions through lecture

demonstrations at the company's main and branch offices, at community centers and before clubs, schools and similar groups; radio talks by the director and a staff of lecturers; distribution of recipes and domestic economy suggestions; articles in the daily newspapers and women's magazines and mail and telephone response to specific inquiries.

The public response and appreciation of this work is tremendous. More than 100,000 women attended lectures and demonstrations at the company's auditoriums during the past year and more than 76,000 called in person for advice. By talks before clubs 28,000 were reached. Over 15,000 letters were received and answered, covering practically all aspects of home-making, and 24,000 telephone calls were cared for. From 5,000 to 7,000 recipes are distributed daily from the main building to customers who call for them in person.

Results of Broadcasting

The friendly and helpful contacts made by means of the radio with persons who are unable to attend lectures are wide and important, and it is significant that invitations to attend special lectures, when issued exclusively by radio, have always brought capacity attendances. It was recently announced over the air that a pattern for an apron would be distributed to all who asked for it, and 1,500 requests were made. Providing patterns is just a slight example of the general home service aid given which does not involve the use of gas. Interior beautifying, budget planning, party plans and dieting are among the activities.

The commercial phase of the company's growth has been striking since 1921, when the industrial department was reorganized on a more comprehensive basis and the Peoples Gas Stores, a subsidiary of the Peoples Gas Light and Coke Company, was incorporated.

The industrial department, together with the hotel and restaurant division and the house-heating section, have been energetically working toward raising the percentage of large-volume users in the total sales. Customers using 50,000 cubic feet of gas per month or over constituted only 17 per cent of the total sendout in 1921. Now over 25 per cent of the company's business over the steady growth of the total sales is shown in the following figures:

Customers Using 5,000 Cubic Feet or More Per Month:

Year	Percentage of Total Sales
1921	17
1922	19
1923	21
1924	21
1925	23
1926	25

From 3,500 to 5,500 customers, depending upon the season, are now using over 50,000 cubic feet of gas per month. The increase over the previous year of these large-volume users was 14 per cent in 1922, 16 per cent in 1923, 6 per cent in 1924, 10 per cent in 1925 and last year it was 18 per cent—the highest the company has had.

Once a customer is taught the advantages of gas, the use per such customer increases rapidly. One company which was using only about 80,000,000 cubic feet in 1921, took 125,000,000 in 1924 and 195,000,000 in 1925. Then, in 1926, it used 415,000,000—an increase of 30 per cent over the combined consumptions of the two previous years.

One company used 8,000,000 cubic feet per month for conditioning wire; another 10,000,000 for baking cores, galvanizing and melting brass; and another 40,000,000 in heat-treating. Still another company bakes between sixteen and seventeen million loaves of bread in Chicago every month and uses 8,000,000 cubic feet of gas.

Industrial Chicago burned 4,476,935,000 cubic feet of gas last year for strictly manufacturing purposes and hotels and restaurants used 3,248,077,000 cubic feet. This is an increase of more than 19 per cent in industrial sales over the year before and about 5½ per cent for hotel and restaurant.

Plans for Future Growth

Chicago is the center of a residential and industrial district which is growing so rapidly that its future scope and activity seemingly have no limits. Considering with this the increasing use of gas in industry and the possibilities of house-heating, refrigeration and other domestic uses, the practicability of which has already been established, the future demands for gas in this area might easily become overwhelming. The Peoples Gas Light and Coke Company, together with neighboring gas companies, began preparation for large future demands in 1921.

The Chicago company's plants and mains are already the heart and arteries of an inter-connected generation and distribution system that serves a large part of the Greater Chicago district. There are eight inter-connections with other gas supply systems. The main artery, across the western flank of Chicago, is four feet in diameter and thirty-four miles long. The carrying capacity of this main at ordinary pressure is 100,000,000 cubic feet of gas every twenty-four hours. This can be doubled, when necessary, by increasing the pressure.

At the north extremity of the main is the company's new 15,000,000 cubic feet waterless holder, which was put into operation early in 1926, raising the storage capacity to 88,000,000 cubic feet. The main runs southward to the Crawford Avenue plant of the Chicago By-Product Coke Co. at the west of the city and thence south and east to the 96th Street Station at Baltimore Avenue and 96th Street.

The Crawford Avenue plant was built in 1921 to serve the Peoples Company and to be acquired by it later. It produces 20,000,000,000 cubic feet of coal and water gas yearly and is capable of greater demands.

Thus the Peoples Gas Light and Coke Company is preparing to make greater history. What it will have accomplished when the next national convention meets in Chicago is a matter for deep musing.

Automatic Volume Control of Steam and Air for Water Gas Sets

By John H. Wolfe

Superintendent Gas Manufacturing, Consolidated Gas, Electric Light & Power Co., Baltimore.

WHEN Lowe invented the three shell water gas set, he little realized how successfully the work of his hands would withstand the ravages of time. Up to the last ten years, very little was done to change the form or operation of his original device. Except for size, the form still remains practically as he designed it. Minor mechanical improvements were made, from time to time, and when finally the hydraulic method of operating the valves was perfected, it was thought that a great step forward had been made. And so it was, for, without the hydraulic system, none of the latter devices for automatically timing the operation of the valves would have been applicable. Thus the "Automatic Gas Maker" was a great advance in the art of gas making since it helped to standardize and maintain uniformity in the cycle of operation. This standardization, in addition to the labor saving which it brought about, was a tremendous boon to the gas industry.

Many other devices have since been put upon the market, such as the "back run," "back blow," and Chrisman cycle, each of which, when added to the water gas sets, has assisted in improving operating results and has thus helped to make gas more cheaply. Several important developments are now under way which will, when perfected, contribute a great deal toward the economical operation of a water gas set. These are the automatic fuel charging machine, and the continuous ash remover or mechanical grate. Both of these pieces of equipment will assist in keeping set conditions much more uniform than at present. since the active fuel bed will be kept at a constant depth and of a uniform density from hour to hour, and from day to day. Any apparatus which accomplishes this deserves the utmost consideration and encouragement from the members of the gas manufacturing fraternity.

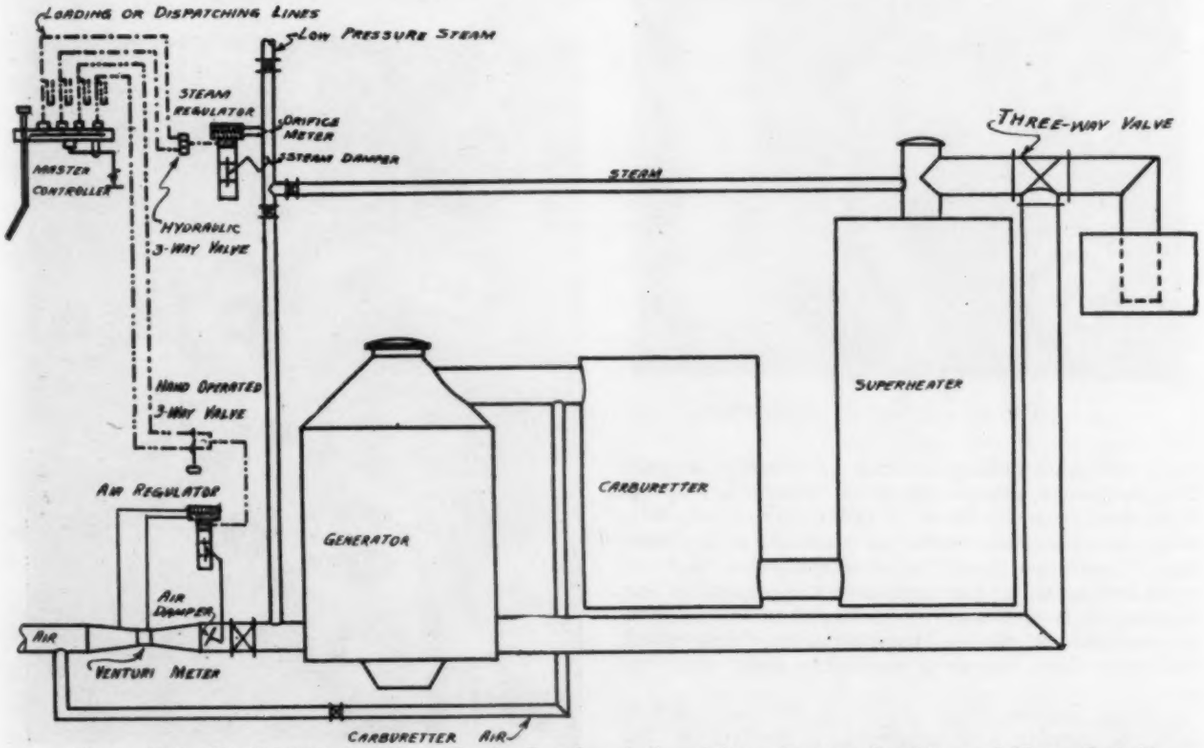


Fig. 1. Water Gas Set With Back Run, Showing Location of Air and Steam Dampers, Regulators and Master Controller

In calling attention to the last two named pieces of equipment, we are taking a peep into the immediate future, whereas this article will deal with devices which have already proved their worth. Especially is this true of a most recent development which enables the water gas operator to automatically control the volumes of steam and air admitted to the set.

If one stops to consider the tremendously large

number of factors which govern the correct operation of a water gas set, one is apt to wonder how even a fair degree of economy was reached in the manufacture of carburetted water gas in the past. One explanation which can be made is that the materials which were used in the past were of a high grade. Thus the gas, oil and anthracite coal used

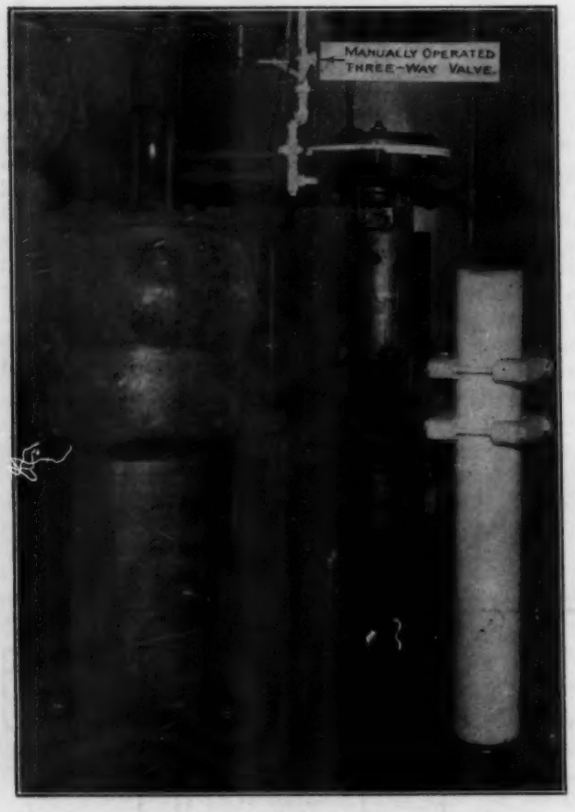


Fig. 2. Generator Air Blast Damper Regulator

were of a high quality and not as sensitive, nor did they require as close a control to secure fair operating results as the fuels of today. Since we must prepare to use, in our business, materials even poorer than those now available, it would seem that we must utilize all of the mechanical ingenuity at our disposal in an endeavor to maintain uniform operating conditions, once we have accurately determined just what these operating conditions are.

Among the two most important factors, which it is both possible and necessary to control in the operation of a water gas set, are the rate of admission of steam and air to the fuel bed. Although the automatic gas maker accurately limits the time during which these materials are supplied to the set, it does not insure the delivery of an exact amount of each in each cycle. This is because of, first, the pressure fluctuations of the steam and air; second, the variations in fuel bed resistance due to the accumulation of ash and clinker, as well as changes in fuel size; and, third, variations in the back pressure of the set beyond the fire, such as checker brick resistance changes. Fluctuations in the steam pressure may be especially severe when using low pressure or exhaust steam. A number of sets may draw from one steam manifold, with the result that the low resistance fuel beds receive too much steam, causing a drop in header pressure, and therefore the high resistance fuel beds will receive too little. The same holds true of the air when furnished from a manifold into which several blowers, operating in parallel, may discharge. The use of an individual blower on each set does not eliminate the difficulty, however, since the fluctuations in fuel bed and set back pressure still remain.

Attempts have been made to partially correct the these variations by manually adjusting dampers in the steam and blast mains. Since these adjustments are made only occasionally and not continuously. the beneficial effect is lost to a large extent.

Boiler-Room Experience Followed

In order to compensate for the factors and variables enumerated above, equipment which had successfully met and solved the difficult problems en-

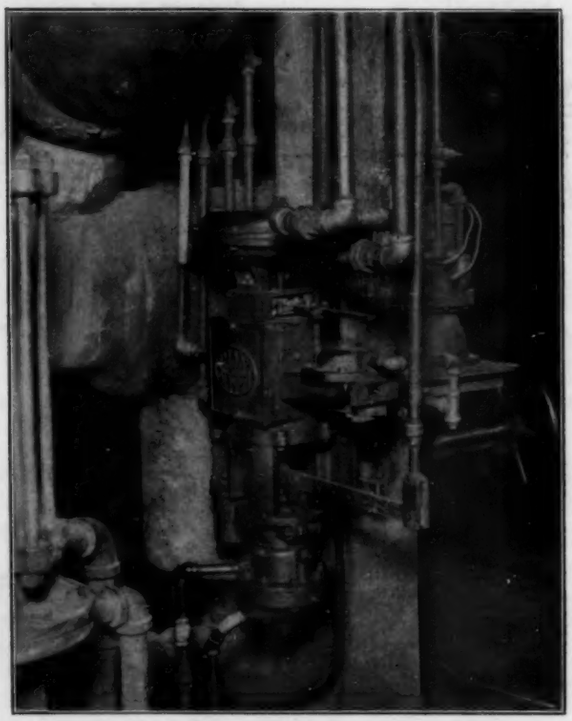


Fig. 3. Steam Damper Regulator

countered in attempting to secure perfect combustion in the boiler room was applied. The application was made to the water gas set as follows: A damper and a flow measuring device were installed in each generator blast and main steam line. These dampers were each connected to a regulator by means of levers and linkages. Pipe connections from each

side of the flow meter or measuring device were run to each side of that particular regulator diaphragm. The meter might be either a Venturi, an orifice or Pitot tube. The drop in pressure across the meter was utilized to counterbalance the effect of either an adjustable weight or air pressure loading on the regulator. When this loading was set at a certain point, the regulator automatically adjusted the damper so as to admit of the proper rate of air or steam flow through the meter under the conditions then obtaining. Since reaction and loading must balance, the regulator does not function for damper control or position, but for actual flow. The position of the controlled unit, the damper in this case, means nothing to the regulator, since it will function to increase or decrease the flow until the regulator is in equilibrium. In this way, as long as there is an excess of supply, the regulator always delivers air or steam at a constant, predetermined rate. By multiplying the rate of flow per unit of time by the time that the main valve is held open by the automatic gas maker, the total volume admitted can be computed.

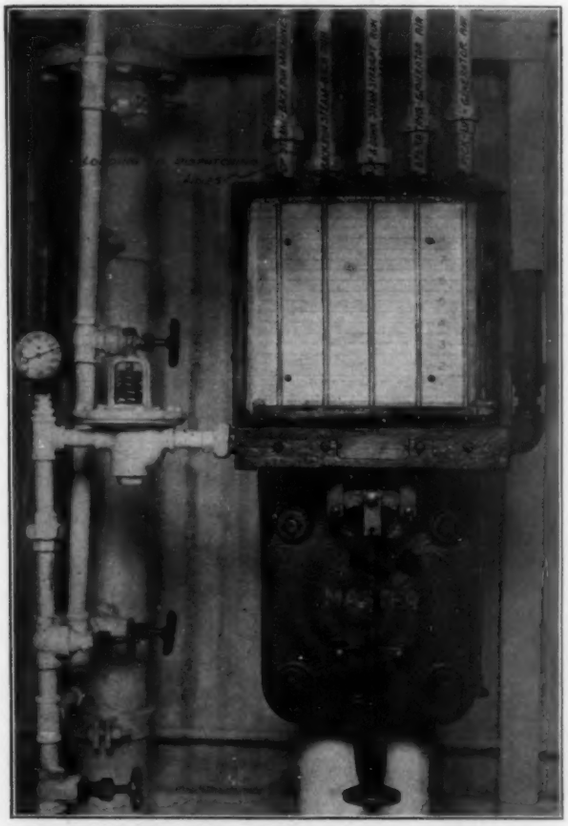


Fig. 4. Master Controller With Loading or Dispatching Lines

Function of Master Controller

The satisfactory part about these regulators is that they are "on the job" every instant, adjusting and readjusting for the instantaneous changes in steam, air and set conditions. A far greater improvement may be secured if, in addition to the regulators, a centralized control unit or "master controller" is installed. Such a master controller has been installed to control eight machines, with two

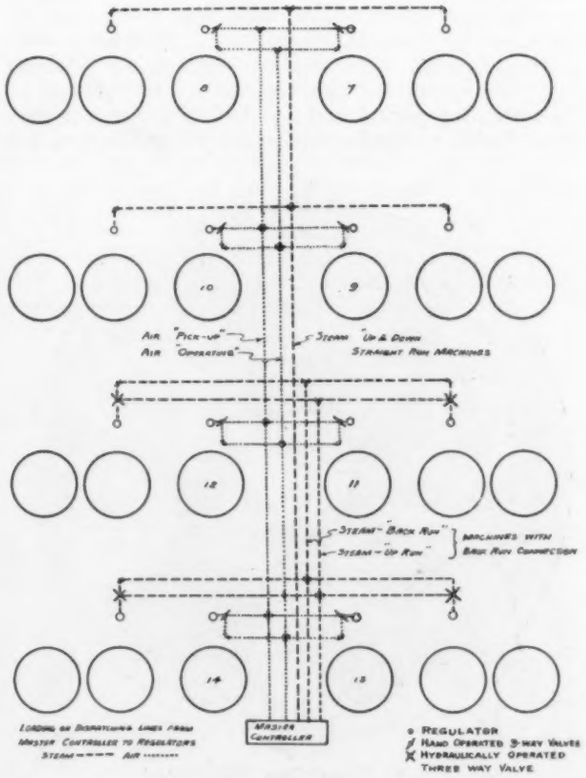


Fig. 5. Layout of Loading Line Connections

regulators on each, or a total of sixteen regulators. The function of this master controller may be compared to the chief dispatcher of a railroad system, who sends orders to govern the movements of all trains in his division. Thus the master controller sends air pressure impulses to all the various regulators. One great advantage of this arrangement is that the loading in all of the machines may be easily changed by adjusting a screw at one point. Another point in its favor is that each column on the master—there may be any number—may be connected to its respective regulators and different loadings may be imposed for different portions of the machine operating period.

Thus it has been found desirable to reduce the rate of admission of both steam and air to the set when the set is first put into operation after "standing by" during a shutdown period, or after a "clean" or ash removal period. At this time the fuel bed is apt to be thin and also very cold, and a period of operation with reduced amounts of steam and air will prove very beneficial. Without any regulators to control the volumes during this period of operation, the set, due to the low fuel bed resistance, is almost certain to receive more air and steam than it can properly handle.

Use of Three-Way Valve

During the major portion of the set operating period, a higher rate of admission is desirable. This change can easily be accomplished by throwing over a three-way valve. This valve will disconnect the "pick up" pressure loading line, which is used when picking up a machine, and will connect the "operating" loading line to the regulator. At the end of the operating period and just before a clean, it may be advisable to again reduce the air and steam, be-

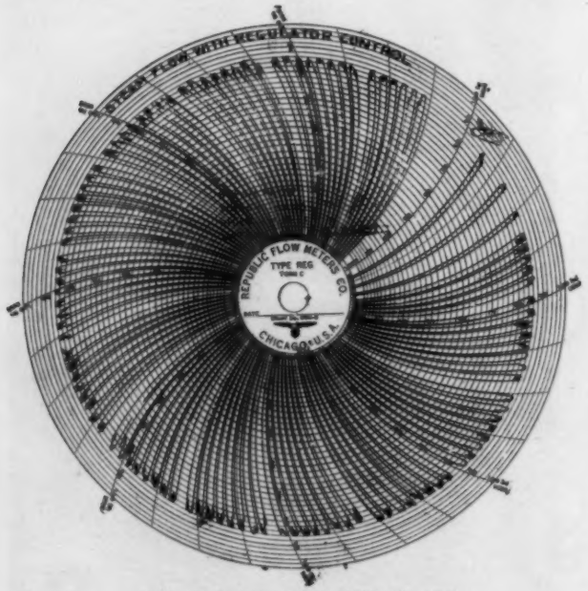


Fig. 6. Steam Flow With Control

cause of the fact that the fuel bed is again very thin, due to the heavy accumulation of ash. The three-way valve may then be switched back.

By providing the required number of loading lines at the master, such adjustments, as increasing the rate of steam flow during the "down" or "back run" over that used on the "up run," may be automatically accomplished. This is done by interposing a three-way valve, which is operated by the steam reversing mechanism, on the two steam loading lines between the master controller and the steam damper regulator. In using the "back run" system, and particularly with certain fuels, this adjustment is of marked advantage in securing good operating results.

In order to make the operation and use of the regulators and master controller more clear, Figure 1 is shown, which depicts in outline a three shell water gas set. The location of the regulators and dampers for the generator blast and steam are included. The loading lines between the master controller and regulators and three-way valves are also indicated. The connections from each side of the flow meters to the regulators may be seen. Figure No. 2, page 34, shows the regulator which is used to actuate the damper in the generator blast line. The manually operated three-way valve, which is used for switching to either the "pick up" or "operating" line, is shown above it. Figure No. 3, page 34, indicates the regulator which operates the damper in the main steam line to the set. The master controller, with the loading lines marked to indicate their usage, may be seen in Figure No. 4, page 35. Figure No. 5 shows the layout of the loading line connections from the master controller to the regulators on eight machines. Only the "back run" operated machines are shown as connected up for loading with two different steaming rates. One rate is used during the up run and another, a higher one, during the back run.

What the Charts Show

In order to show the results obtained and the improvement resulting from the use of the regulators and control, a series of charts are next included. Figure No. 6 shows a steam flow meter record, when using the control, while Figure No. 7 shows a record made when the control was disconnected. A marked difference in the uniformity of steam flow of the former over the latter will be noted. Figure No. 8 likewise is a record of the air flow through the meter set in the blast line with the control in operation, while Figure No. 9 shows the results of disconnecting the control. Again a marked improvement of the former over the latter may be observed.

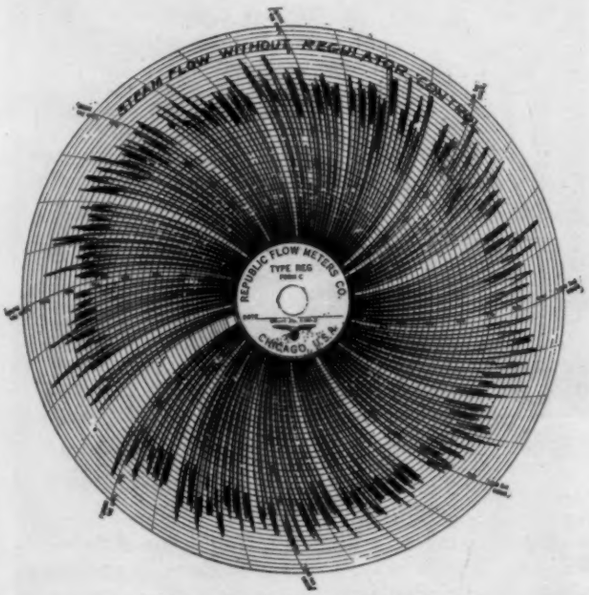


Fig. 7. Steam Flow Without Control

A direct result of this uniform blasting is shown by the results obtained from the waste heat boiler operation, Figure No. 10 being produced from waste heat boiler steam flow meter when the blast control is connected and Figure 11 when the control is disconnected. The results of non-uniform blasting are very pronounced here. Figure 12 is included to indicate the ease with which an analysis of trouble may be made when using the control. At points

marked "A" the damper in the blast line was wide open, as evidenced by the reduced air flow at these points. In other words, the air pressure was not great enough to overcome the resistance ahead of it, with the result that the flow was reduced and the damper opened wide. In all probability the fuel was badly clinkered and the air could not get through.

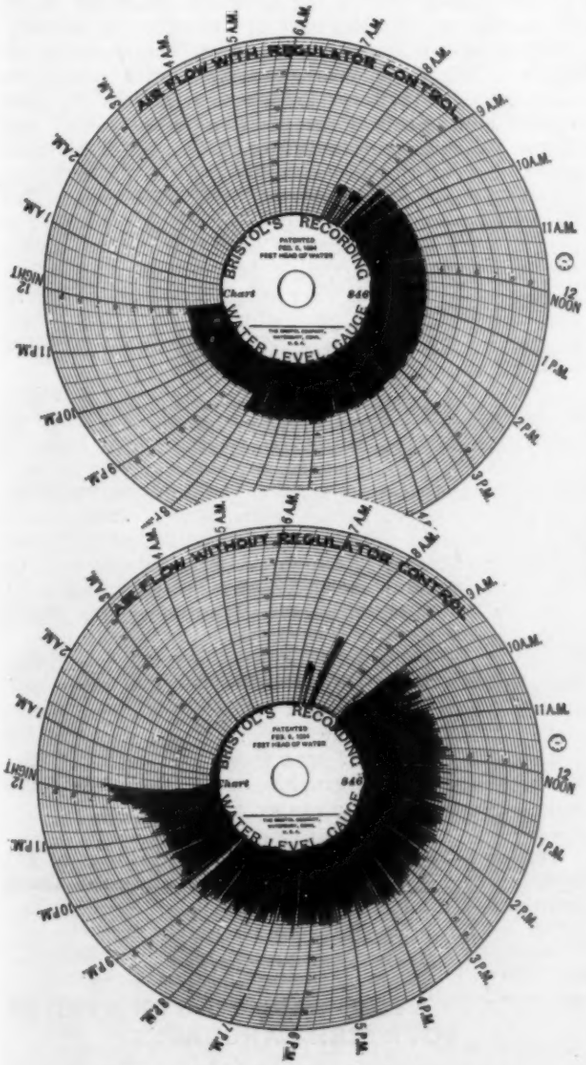


Fig. 8 (*above*) *Air Flow With Control*
Fig. 9 (*below*) *Air Flow Without Control*

Experience obtained over a year's operation of these regulators and the control has shown that they are of marked assistance in securing smooth and uniform set operation. Our conclusions are drawn and listed as follows:

What a Year's Operation Shows

First—We have found the equipment to be satisfactory mechanically. Even though the regulators and master are very sensitive, they are rugged and will withstand the severe service imposed on them by "gas house" conditions.

Second—The cost of operating and maintaining the equipment is very small.

Third—The equipment lends itself to ready adjustment to meet varying operating conditions and thus facilitates the operation of the sets.

Fourth—We found the clinker and ash to be more uniform in texture when using the controls than when the controls were disconnected. This resulted in a shorter cleaning period, even though the time between clinkering periods or "cleans" was materially increased.

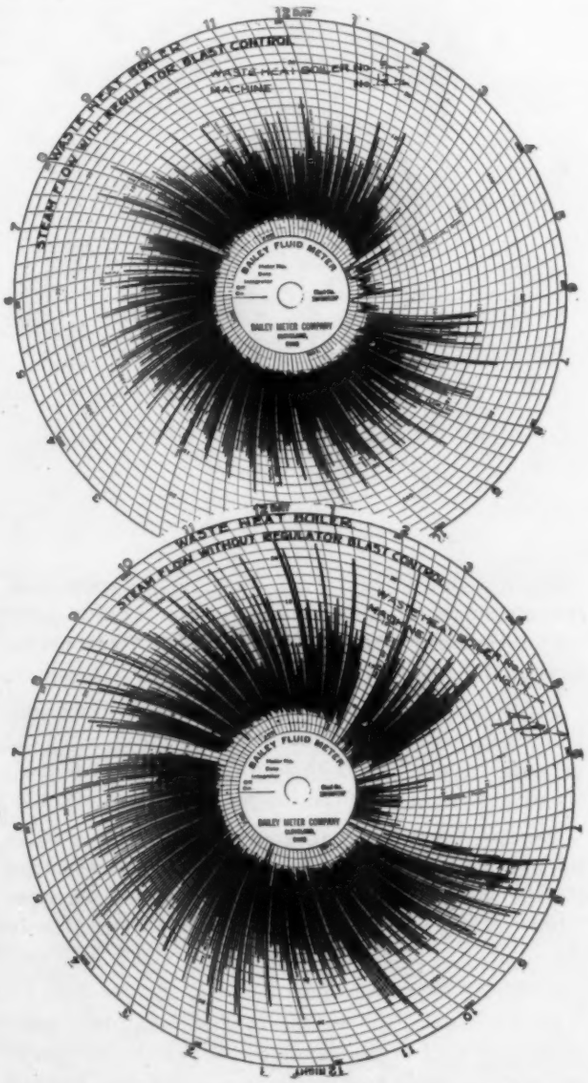

STEAM FLOW WITH REGULATOR BLAST CONTROL
BAILEY FLUID METER
STEAM FLOW WITHOUT REGULATOR BLAST CONTROL
BAILEY FLUID METER

Fig. 10 (*above*) *Steam Flow With Control*
Fig. 11 (*below*) *Steam Flow Without Control*

Fifth—We found that by using the controls we were able to secure a greater number of runs between cleans.

Sixth—The temperature at the base of the superheater, which we use as the control point for oil cracking, is maintained much more uniformly under the volume control method. By maintaining this temperature uniform much higher oil efficiencies are secured.

Seventh—We also noted a reduction in the amount of fuel blown over into the dust collectors at the generator outlets. This we attributed to a reduction in the air shock because of regulation on the air blast.

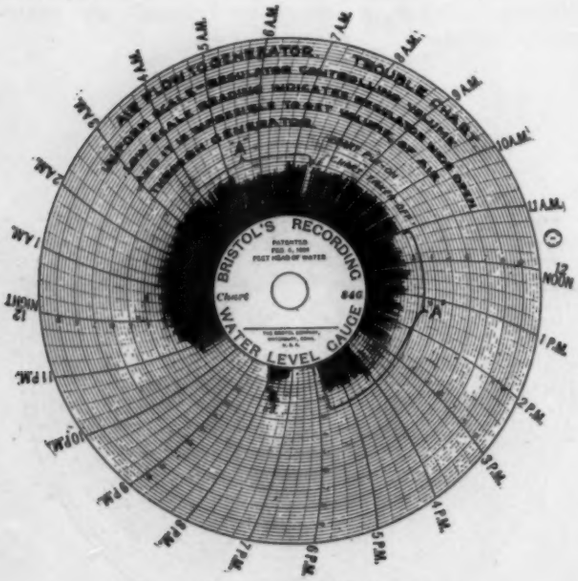


Fig. 12. Trouble Chart

Eighth—We observed a decrease in the amount of live steam required for "make up" to the low pressure or exhaust steam header because of the operation of the steam regulators on the sets.

Ninth—The fuel bed is kept in a much more uniform condition due to the accurate regulation of the air and steam. This is shown by the improved quality of gas made over the longer operating period.

Tenth—The amount of steam produced per cycle by the waste heat boilers is much more constant than it was prior to the installation of volume regulation. The tendency is also toward a reduction in the amount of steam made per cycle, which indicates a generator fuel saving.

In conclusion, the writer believes that this relatively new tool in the hands of the water gas operator may be made to contribute a great deal toward the successful and economical operation of water gas plants. It will also assist in setting a new high standard in economy in the use of the main manufacturing materials, gas oil, generator fuel and steam, which represents boiler fuel.

WESTWARD THE COURSE OF INDUSTRY TAKES ITS WAY

In January, 1908, the center of industry in the United States was on the northern boundary of Indiana, about 110 miles east of Chicago. In January, 1918, it was still on the northern boundary of Indiana but had moved about 50 miles nearer to Chicago. In January, 1926, it had moved 25 miles to the southwest of its position in 1918 and was about 50 miles southeast of Chicago. The total movement in the 18 years from 1908 to 1925 was about 75 miles in a west by south direction. This slow movement of the center of industry during a period when the capacity of prime movers in central stations and manufacturing plants increased about 140 per cent indicates that industrial development in the United States is proceeding at about the same rate in all sections but a trifle more rapidly in the western and southern parts of the country.

These determinations of the center of industry, which have been made by the Geological Survey, Department of the Interior, are based on the capacity of steam engines, steam turbines, water wheels, and internal-combustion engines installed in manufacturing plants and in public-utility power plants, as it is used twice as much as power equipment in manufacturing plants. Previous determinations of the center of industry have been based on the installed capacity of prime movers in manufacturing plants only.

The geographic center of the United States is near the center of the northern boundary of Kansas, and the center of population is in Owen County, Southwestern Indiana. The center of industry of the United States in 1926 was therefore 640 miles east by north of the geographic center and about 170 miles due north of the center of population.

It would be interesting to check the center of gas consumption in the United States against the above location.—Editor.

NOTICE OF UTILITY MEETING PRINTED IN FOURTEEN LANGUAGES

An unusual type of American socialism was illustrated by the notice of the annual meeting of the Illinois Power Company, says the Pennsylvania Public Service Information Committee. The notice was printed in fourteen languages and gives a new measure to the widening distribution of stock ownership.

Along with the text in English, German, French, Greek, Jewish, Italian, Polish, Russian, Hungarian, Dutch, Finnish, Slovak, and Swedish went lines in Chinese. Not that the company knew so much about its Chinese stockholders, but just by way of making the notice complete, the message in Chinese was included.

It is now on the records that those Chinese characters drew several Chinese to the meeting, power and light users all.

Safety and Production in the Coke and Gas Producing Industries

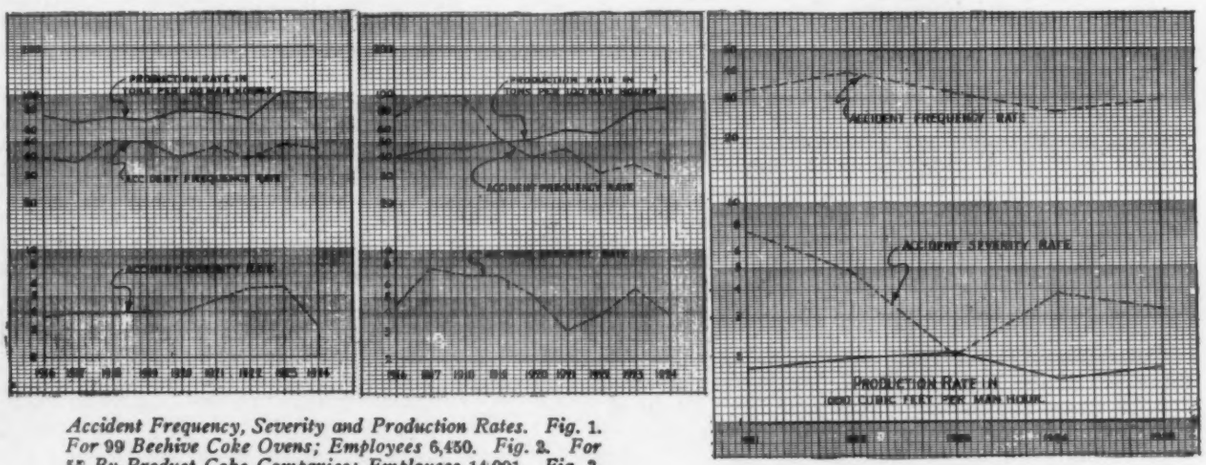
By J. E. Hannum

Director of Safety and Production Study, American Engineering Council

THE Committee on Safety and Production of American Engineering Council has recently completed its study of the relationship between industrial accidents and production,* which was made upon invitation of the National Bureau of Casualty and Surety Underwriters, to prove or disprove the common belief that "the safe factory is the efficient factory and the efficient factory is the safe factory."

so long a period as records were available. These were: (1) average number of employees per year, (2) number of man-hours worked per year, (3) annual production, (4) number of lost time accidents per year, and (5) number of days lost due to lost time accidents per year.

Accident and production rates were calculated from these statistical data by using the quantity of pro-



Accident Frequency, Severity and Production Rates. Fig. 1. *For* 99 *Beehive Coke Ovens; Employees* 6,450. *Fig.* 2. *For* 55 *By-Product Coke Companies; Employees* 14,001. *Fig.* 3. *For* 7 *Gas Producing Companies; Employees* 2,378

It is well known that there has been a great increase in the productivity of American industry during the past few years. On the other hand, there is considerable evidence of an upward tendency in the aggregate number of accidents and their severity, for industry as a whole. This apparent increase in the industrial hazard per man-hour is the condition which brought about the study. One objective of the committee, therefore, was to find out whether an increasing hazard is inevitable or whether accidents can be controlled under modern industrial conditions. In showing that accident rates can be steadily brought down, at the same time the rate of production is increased, the committee concludes that the initiation of accident prevention is as much a responsibility of the major executives of industry as is the initiation of improvements in productivity.

In order to determine the relationship between accidents and production, experience records were gathered from a large number of industrial plants. Five major items of information were obtained for

duction, the number of accidents, and the number of days lost in each case as reported, as the numerators for rates of production, accident frequency, and accident severity respectively. Comparable rates were obtained by using the man-hours worked as the common denominator.

Nation-wide Study

The scope of the study is nation-wide and covers over 120 products in the following industrial groups: cement, chemical, coal mining, coke, electric light and power, electric railways, gas, iron and steel, lumber, machine building and metal working, men's clothing, mineral mining, paper, pulp, and paper products, quarrying, steam railways, telephone and telegraph, textile, woodworking, and miscellaneous. Records were analyzed of 14,000 companies with an aggregate experience of over 122,000 company-years. These companies had two and one-half million employees in 1925, with a total exposure of 13 million man-years, or nearly 55 billion man-hours.

These data are analyzed in the report from five points of view: (1) to show the levels of performance with regard to safety and production and at

* The complete report of "Safety and Production" is being published by Harper & Brothers and will be ready for distribution in October, 1927.

the same time to indicate the possibilities of improvement; (2) to show the trends of accident frequency and accident severity rates in terms of production; (3) to indicate the net changes in both the accident and production rates for two significant years, 1922 and 1925; (4) to indicate the productive time and value lost as a result of industrial accidents, and (5) to determine, according to the least square method, the increases or decreases in the rates of production, accident frequency, and accident severity in terms of man-hours. There are 250 charts showing trends of the rates.

Beehive Coke Industry

Accident and production statistics for the coke industry were obtained from the United States Bureau of Mines covering the experience of 99 beehive companies and 55 by-product companies from 1916 to 1924.

The aggregate experience of the beehive plants surveyed shows that an increase of 47 per cent in the rate of production occurred during the nine-year period. There was almost a steady increase in the rate from 73.4 tons per 100 man-hours in 1916, to 100.5 in 1924. During the same time there was an overall increase of 9 per cent in the accident frequency rate and an increase of 27 per cent in the accident severity rate. The accident frequency rate for 1916 is 39.1 accidents per 1,000,000 man-hours, while for 1924 it is 44.9. The severity rates are 3.68 and 3.16 days lost per 1,000 man-hours for the respective years. (See Figure 1.)

Because of the increase in the rate of production, the frequency and severity of accidents decreased, when expressed in terms of production. Frequency decreased 20 per cent from the rate of 53.1 accidents per 1,000,000 tons in 1916, to 44.8 in 1924, while severity decreased 8 per cent, from 5.00 to 3.15 days lost per 1,000 tons.

By-Product Coke Industry

The by-product coke plants studied have had a continuous improvement in their accident and production performance during the last nine years, as shown by marked increases in the rate of production and equally marked reductions in the frequency and severity of accidents. The most pronounced reduction has been made in the number of temporary disabilities of from one to fourteen days duration. The production rate increased 107 per cent, the accident frequency rate decreased 75 per cent, and the accident severity rate decreased 37 per cent. In 1916 40.5 tons of coke were produced per man-hour worked, while in 1924 the production rate was more than doubled to 81.6 tons per man-hour. The number of accidents per 1,000,000 man-hours dropped from 71.9 in 1916 to 29.0 in 1924; the severity of these accidents measured in days lost per 1,000 man-hours was reduced from 4.42 to 3.83. (See Figure 2.) When this fall in the number of accidents is combined with the rising production, still greater reductions in the frequency and severity of accidents in terms of production occur, the decreases being 92 per cent and 69 per cent, respectively.

Gas Producing Industry

Twenty-five gas producing companies co-operated in the study by supplying data from their records covering an aggregate experience of 95 company-years, 16,815 employees, and 197,691,000 man-hours.

The general tendency for this representation of the gas industry is a slight reduction in the rate of production, when expressed in thousand cubic feet of gas per man-hour. This performance, however, is accompanied by marked reductions in the accident frequency and accident severity rates. For the combined experience of seven companies from 1921 to 1925 the production rate decreased 8 per cent, the accident frequency rate decreased 24 per cent, and the accident severity rate decreased 61 per cent. (See Figure 3.) The performance of 18 companies over a period of three years from 1923 to 1925, conforms very closely to that of the seven company group over the same period; it is, production rate decreased 10 per cent, accident frequency rate decreased 14 per cent, and accident severity rate decreased 12 per cent.

The safety and production performance is fairly uniform throughout the experience of individual gas companies, which supplied data, although one small company with less than 100 employees showed marked increases of 96 per cent and 116 per cent in the accident frequency and severity rates respectively over a five-year period from 1921 to 1925. On the other hand, the experience of another company demonstrates the possibility of a favorable safety and production performance. The production rate of this company increased 10 per cent from 1921 to 1925, while the accident frequency rate decreased 45 per cent and the accident severity rate decreased 83 per cent.

Findings of the Committee

The findings of the committee, resulting from the exhaustive study of the broad experience gathered, are set forth in detail in the report. They are most significant and deserve the thoughtful consideration of every industrial executive. Some of the findings are:

"Maximum productivity is dependent upon the reduction of accidents to an irreducible minimum. There is such a close relationship between safety and production that it is impossible for a plant to have continued increases in productivity unless it reduces at the same time its accident rates.

"The experience of individual companies unquestionably shows that material reductions in accident rates can be simultaneously obtained with increases in production rates.

"Many industrial executives have not given to accident prevention that degree of attention and direction that its economic and humanitarian significance warrants.

"Some industrial executives feel that because of compensation insurance carried their responsibility has been met, hence they do not concern themselves with accident prevention.

"The initiation of accident prevention is as much a responsibility of the major executives as is the initiation of improvements in productivity.

"The accident and production performance of the best plants in each industry clearly shows that tremendous improvements can be achieved by the remaining plants in each industry.

"The incidental or accompanying cost of industrial accidents is a large loss but little realized in the operation of industry.

"Minor accidents are accountable for a much larger loss of productive time and value than is generally recognized.

"Organized safety work, which is effective in reducing the frequency and severity of accidents, is being carried on only in a relatively small percentage of industrial plants.

"A large number of companies keep no accident records and make no attempt to analyze their experience to determine ways and means of decreasing accidents."

Recommendations of the Committee

The Committee on Safety and Production recommends:

(1) That the same executive direction and control be given to decreasing industrial accidents as is given to increasing productivity.

(2) That those agencies which collect and disseminate accident statistics adopt uniform terminology and standardize their records so that they may be compiled on a comparable national basis.

(3) That the executives of those plants, having high accident frequency and accident severity rates, initiate, direct and control ways and means of lowering such rates to at least the low rates obtained by other plants in their industry.

(4) That industrial trade associations, engineering societies, and other agencies concerned with the improvement of industrial operation bring to the attention of their members the necessity of improvement in safety performance as a vital step in the strengthening of their industrial position.

(5) That industrial trade associations secure, compile and analyze industrial accident statistics for the purpose of determining the lowest accident rates possible of attainment for their respective industries.

(6) That industrial trade associations endeavor to secure such action on the part of executives of their industries as will result in each plant having the lowest possible rates obtainable.

This study of "Safety and Production" forcibly brings to the attention of all executives throughout industry not only the importance of organized safety work as an effective means of reducing the frequency and severity of accidents, but also the positive influence of such work upon the productivity of industry. It charges industrial executives with a definite responsibility in initiating, directing, and controlling accident prevention activities. It marshals a fund of recorded experience, which conclusively demonstrates that the accident situation, in any plant and every industry, can be controlled, and that the accident hazard can be steadily decreased, while productivity is steadily increased. It establishes high and low levels of performance in safety and production and indicates the zones of tremendous improvements yet to be achieved. It is an exhaustive accumulation of evidence which proves that "the safe factory is the efficient factory and the efficient factory is the safe factory."

In presenting the report to the industrial world the Committee on Safety and Production of American Engineering Council confidently anticipates that it will have a profound influence toward the advancement of the safety movement in American industry.

TEXTILE MILLS NOW GREAT GAS USERS

Textile mills of the United States now rank among the largest consumers of manufactured gas for industrial heat, and there are approximately 250 individual mills which use a million or more cubic feet of gas a month each, according to Textile World.

To furnish the heat needed to singe a million yards of cloth, about 75,000 cubic feet of gas are required, and to heat the calender rolls for a million yards, 50,000 cubic feet more.

Dyeing, bleaching and finishing cotton goods is now done with gas heat, and in woolen and worsted mills gas is used for singeing and to supply steam for other processes.

One thousand knitting mills now generate their steam mainly with gas fuel, says the report.

The use of gas for industrial heating goes back only to the beginning of this century. At the present time it is estimated that one-quarter of the country's production of more than 400 billion cubic feet of gas a year is consumed in American industrial plants.

HARRY C. ABELL'S REMARKS ON HOUSE HEATING

In the outlook for house-heating business, the gas industry has as its most powerful friend the public itself. The American love of comfort and convenience will prove the trump card of the gas industry. Five years ago the manufacturer of gas-fired house-heating appliances concentrated in the natural-gas territories; now he sells most of his output in the manufactured-gas sections. Heating of houses is becoming an increasingly important factor of every gas company's business.

Merely figuring two per cent of the present gas customers as prospects for gas heating within the next few years would mean an added consumption of 110,000,000,000 cubic feet of gas, or approximately one-quarter the present sales. Leading gas engineers, looking into the future, claim that all companies must work ahead with the idea that the use of gas for house heating by five per cent of their present customers would increase sales approximately fifty per cent.—Gas Progress.

Perfection in a Commonplace

By George R. Leighton

Consolidated Gas Company of New York

A KITCHEN has generally been regarded as a commonplace, a commonplace in all that the word implies. History began in a kitchen and ever since, while man has struggled and progressed, has devised the words science, art, music, literature and invention, the kitchen and its functions remain what they were at the beginning, the starting point of all his effort. Hand and brain are powerless until he has been fed.

While restless ambition and mind have explored countless unknowns and, in the present age, have brought invention to a climax, yet, until very recently, the kitchen was regarded as a place to cook in and little else, although it has served a thousand other purposes. Fundamental as an institution, little or no thought was expended to improve it, beyond the introduction of isolated appliances.

As if to escape the commonplace, a rise in fortune meant increasing distance from the cooking quarters and an attempt to forget the kitchen entirely. "Below stairs," the domain of the scullery maid and the pot boy! Housework and cookery were considered degrading occupations and, in America, furnished steady employment to the latest immigrating nationalities. The Germans, the Irish, the Swedes and the Slavs, in succession, have all served their turn, only to abandon such employment the instant they were able.

An Incongruous Situation

What an incongruous situation! Ever increasing demand for the refinement and glorification of food as it appeared in the dining room, with no regard whatever either for the equipment and skill necessary to achieve such refinement or for those who did the work.

Has it taken so long to realize that cooking is, in the most exact sense, one of the creative arts, however fleeting its triumphs may be? A sentimental recollection of the apple pies of childhood is the usual and only tribute. So slow has been the rise of the kitchen in the esteem of mankind, that we regard with amazement the fact that the cook houses in Pompeii had hot water pipes. We accept the Roman law and architecture as a matter of course and are awed when we hear of an ancient waffle iron.

The single room cabin of the American wilderness was a kitchen first of all and around its rude fireplace, with its swinging crane and blackened kettles, the family was raised, the children taught and all the household arts developed. Later when the "farmhouse" and "homestead" appeared the kitchen still held its own, but "beauty" (and what beauty!) belonged in the parlor, which was so seldom used that its sacred Brussels could be handed down unfrayed for generations.

But with the coming of the industrial era and the overcrowding of cities, the kitchen, for those who could afford it, was banished to the basement and handed over to the alien and the stranger, or, if the housewife still had to carry on, the kitchen steadily shrank in size until it became a cubby hole termed a kitchenette. The kitchen was a necessary evil and that was all. Emancipation through the loop hole of the restaurant was its finish.

True, the mechanical age brought with it inventions which made cooking less laborious. The cook stove, first with wood as a fuel and then with coal, supplanted the open hearth method, and later the gas range outmoded the cook stove. Crude ice boxes evolved into refrigerators and ice cream freezers, waffle irons, bread mixers and all the culinary tin and iron mongery appeared in due course.

But these appliances were accepted simply on the score of what they could do and not in relation to each other. In other words, the kitchen was still a tool shed. The planning of a library or a drawing room was a serious and sometimes awful matter. Any room, provided it had an iron sink and a cook stove, was good enough for a kitchen. No thought for connection with the cellar, no planning for correctly placed artificial light, nor for proper floor covering or refrigeration, least of all, no attempt to so design the kitchen that there should be no waste spaces and yet ample room for every sort of kitchen activity.

The Upward Turn

Then came the entrance of women into business and the professions. As a curious concomitant, as women began to desert the ranks of housewifery, the profession of the home-maker took on a new interest. The word "domestic science" was invented and the study of food and dietetics came in. Housework ceased forever to be regarded as unskilled labor. Naturally a crop of new questions were asked and the kitchen came under a searching scrutiny.

And when the housewife observed the rise of legislation in behalf of accident prevention and health regulation for labor, she not unreasonably asked: "If the kitchen is the workshop of the family, then why is not the housewife protected as other workers are? Is it fair that I should cook in a windowless kitchen when a factory hand has sunlight? Is it right that I should have to use clumsy, inadequate equipment, arranged without intelligent planning, when a mechanic has everything to assist him that ingenuity can devise?"

Action followed hard upon all these questions, and when the thought of a kitchen as a unified whole

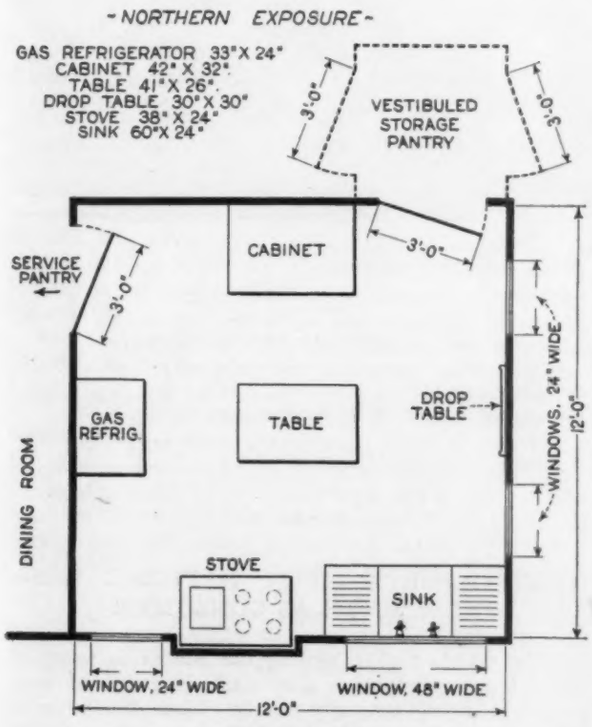
dawned upon someone's startled consciousness a new order of things began.

Since man, according to his lights, strives or likes to think he strives for perfection, we ask for the first time since the exodus from Eden, how may we achieve a perfect kitchen?

Beyond a certain point, this is an unanswerable question. Types of equipment and their arrangement, color and furnishing must always be a matter of taste and opinion. But there are certain fundamentals that hold everywhere and are the basis of a perfect kitchen, however ambitious or modest it may be.

Starts At Scratch

You cannot haphazardly pick out a room and by a process of prettification turn it into a model kitchen. A model kitchen starts at scratch, with no restrictions, and this article proposes to demonstrate, from the point of view of the engineer and architect, those certain fundamentals which can be observed.



A Practical Kitchen

The accompanying diagram, drawn to scale, details the kitchen and a portion of its equipment. The house complete, designed for a family of six, is to cost presumably from thirty to forty thousand dollars.

First, the question of dimension and exposure. The legal requirements for a tenement kitchen in the State of New York demand at least seventy square feet of floor space and one window open to sunlight. There is no minimum requirement for private residences. In the opinion of Mr. Nils T. Sellman, Engineer of Utilization of the Consolidated Gas Company of New York, a room twelve feet square with exposures to south and west is preferable. A kitchen so situated has the advantage of the morning sunlight and is altogether a more cheerful work room.

The wall has a wainscot of tile, 72 inches high, with rounded, dustless corners and edges at top and bottom. The ceiling and wall above the wainscot are painted, the finish being a flat color rather than a glaze. Color is a matter of taste, but an unglazed surface somewhere between cream and pale tan in tint is the most restful to the eyes.

A pure white kitchen is ruled out on the grounds of eye strain.

Floor Covering

The floor covering is either linoleum or some type of rubber title, cement laid. This makes an absolutely secure floor. Arguments for or against a figured pattern are considered only since the figured designs are slower to show wear. This linoleum also serves as a floor covering for both the service pantry and the vestibuled storage pantry on the farther side of the room, and to facilitate floor cleaning, neither of the doors of these two pantries are silled. All doors facing the kitchen are smooth surfaced and without panels. With a door of this sort, a few strokes with a damp cloth are all that is necessary for easy cleaning.

The table, 26 inches wide and 41 inches long, where much of the work is done, stands in the middle of the room. With a square kitchen this puts the work table exactly in the center of things, adjacent to range, sink and refrigerator.

The gas range, the most important appliance in the room, is placed on the south side, directly to the right of the sink. In Mr. Sellman's opinion, the range should be partially recessed. This recess is also tiled, the tiles running clear to the range hood which covers the entire over all width of the stove. Under this condition, the hood being vented to a chimney connection, the entire section where grease collects is easily cleaned.

Location of Sink

To the left of the range is the sink, flanked by two drainboards, in all, 60 inches long and 24 inches wide. The sink, with both boards, is one piece, of enamelled iron and should be approximately 37½ inches high. A swing faucet, connecting both hot and cold water, is used. The radiator, heating the kitchen, can well be placed either under the sink or one of the drain boards.

Above the sink and running almost its entire length is a low window, 48 inches long, divided into three three-quarter sashes. Such a window gives ample light for work at the sink and with the window at the right of the recess allows no chance for shadows while work at the range is going on. These windows above the sink, on chain sash cord, raise into the wall and are more satisfactory than casements. Casements demand a sliding rod and screw, which not only are constantly in the way, but are quite as constantly getting out of order. All window frames in the kitchen are of steel to prevent swelling.

Placed centrally against the north wall is the kitchen cabinet, 42 inches wide and 32 inches deep, running to the ceiling, 9 feet high. The depth given applies to the first three shelves, which are topped by a stone surface, suitable for pastry work, which runs clear to the wall. The shelves above this working ledge are 22 inches in depth. High shelves, though open to criticism as being out of reach, yet seem to retain their hold as storage space for kitchen ware seldom used. The cabinet, of course, is permanent, set in the tile, with the usual dustless edges. All china and glassware for the dining room, naturally, are stored in the service pantry where the dishwashing is done.

Disposition of Lights

Artificial lighting demands a strong bulb under the range hood, bulbs at either side of the sink, one of the so-called kitchen bowl lights over the work table and another directly over the cabinet board. Lights on either side of the cabinet, unless on extremely long brackets, will cast shadows and are less satisfactory than a light immediately overhead.

From this point personal preference enters into consideration. Exposures, properly placed artificial light, a recessed range and a central working table are scarcely open to argument, being as nearly axiomatic as human nature will allow.

The placing of the gas refrigerator, however, must depend upon choice. Placed in the center of either the east or west wall it is exactly the same distance from work table and cabinet. If placed on the east side, the gas refrigerator, 24 inches deep, 33 inches wide, and 62½ inches high, will more than comfortably fit between the two windows. If placed opposite, it is convenient to the service pantry door. In either case, the side opposite to the refrigerator allows room for a drop table, folding into the wall, which may or may not be used in lieu of a breakfast nook. This again is optional, but if the kitchen is designed for both housewife and maid, then the drop table should be retained.

The gas refrigerator is placed in the kitchen rather than the storage vestibule, not only to allow greater ease of access, but because it functions best in a heated space, subject to the same temperatures the year round. Under these conditions, according to Mr. Sellman, one secures uniform performance in ice cubes and a constant refrigerating temperature is maintained.

Pantries Not Considered

The door on the north side of the room opens on a vestibuled pantry, suitable for temporary dry storage. This door swings inward. In the vestibule proper are two other doors, the outside door on the east opening outward. The one on the west, leading to the cellarway, opens inward. The plan of the pantries, aside from the placing of the doors, is not considered here, for they are outside the kitchen proper.

Exposure, dimensions and light, these are the indispensables for a perfect kitchen. They are presented here. The equipment is another story.

But if this age, with its incessant change and the constant acceleration of life, has taken from the kitchen much of the family interest and activity that once found a place there, yet it is still the vital spot of the home and as such deserves as near an approach to perfection as man can devise. A common place, a place common and near to the lives of us all, but never again a commonplace.

CARBON BLACK FROM NATURAL GAS

Over 130 billion cubic feet of natural gas were used in 1926 for carbon black manufacture, according to statistics for the carbon black industry published by G. R. Hopkins of the U. S. Bureau of Mines, giving the extent to which this industry operated to make carbon black from natural gas in 1926. There was an increase in production of 2 per cent over the preceding year, but stocks increased by 13 per cent and sales declined by 5 per cent. A number of mergers or consolidations reduced the operating companies from 42 to 33, compared with the preceding year, but the number of plants operating remained virtually the same at 62. The following are significant figures for activities of the industry in 1926:

Carbon black produced:	Pounds
By channel process	152,300,410
By other processes	28,275,766
Total	180,576,176
Stock held by producers December 31	108,378,101
Losses	716,813
Sales	167,504,710
Total value (at plants) of carbon black produced	$9,939,221
Average per pound (cents)	5.5
Estimated quantity of natural gas used (M. cu. ft.)	130,321,000
Average yield per M. cu. ft. (lbs.)	1.4

OHIO IMPORTS MUCH NATURAL GAS—NOW SIXTH AS CONSUMER

Ohio stands eighth among the States in point of natural gas production and sixth in point of consumption, using annually nearly 70,000,000,000 cubic feet, which she is compelled to import, according to a recently issued report of the United States Bureau of Mines.

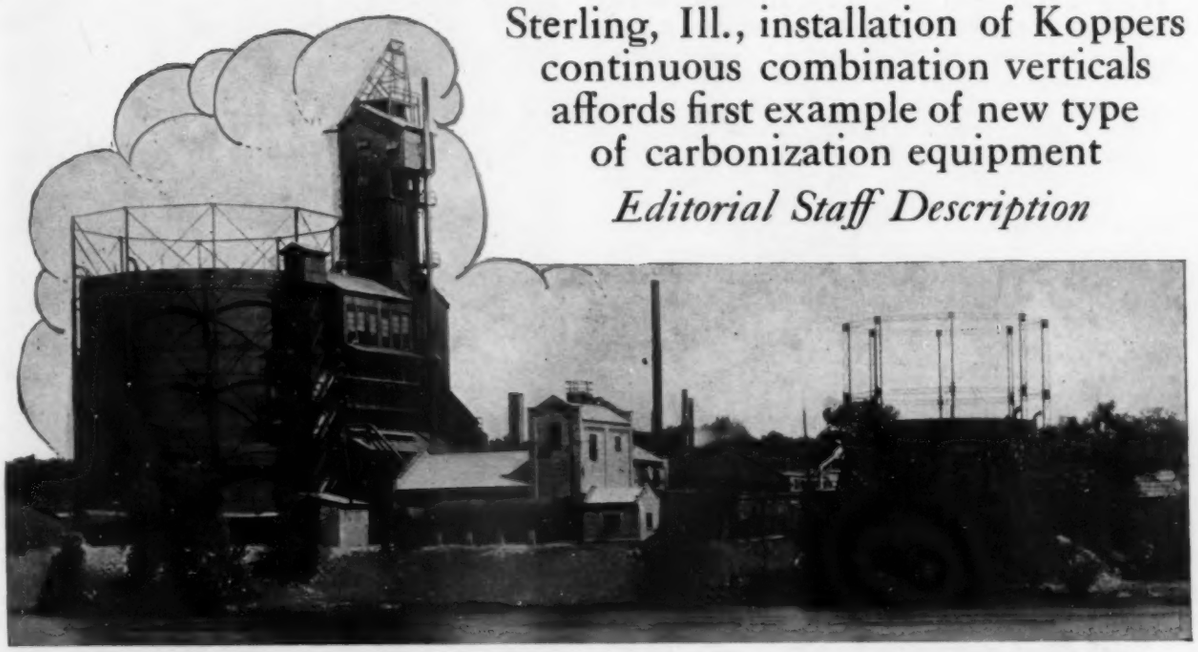
This report shows that although natural gas is found in twenty-two States, only four of these produce amounts in excess of their own requirements. West Virginia, from which Ohio draws practically all of the above mentioned 70,000,000,000 cubic feet, is the chief exporter, furnishing gas in large quantities to New York, Pennsylvania, Indiana and Kentucky as well.

Ohio, the report shows, produces but 43,235,000,000 cubic feet annually, as against her annual consumption of 111,969,000,000 cubic feet.

Continuous Vertical Ovens for Small Works

Sterling, Ill., installation of Koppers continuous combination verticals affords first example of new type of carbonization equipment

Editorial Staff Description



Continuous Vertical Oven Plant of the Illinois Northern Utilities Company, Sterling, Illinois

CARBONIZATION equipment for the small gas works has been a problem of importance to all builders of coal-processing equipment for years. The Koppers Construction Company is now showing to visitors their latest answer to this problem in the new plant of the Illinois Northern Utilities Company, at Sterling, Illinois. This plant consists of a battery of five continuous vertical combination ovens of the latest type, the first installation which has been built commercially other than the experimental battery at the Seaboard plant in Jersey City. This new plant has a total gas-making capacity of 750,000 cu. ft. per 24 hours, each oven treating 12 tons of coal per day. The auxiliaries of the plant include a Koppers gas producer, coal and coke handling equipment and a by-product recovery plant.

Why a Vertical?

The objective sought by the builders of this equipment was a small-capacity plant suitable for gas-company operation, giving an efficient and economical production of gas and coke with low operating and maintenance cost. This new plant is believed by the builders to meet these requirements and furnish products comparable in value to the products from the usual large-size horizontal oven. The ground area required is small for this type of plant, and its operation is so nearly smokeless and dustless that it can be located at points where this form of nuisance would commonly render a coal-processing plant objectionable.

The development of this equipment has been in progress for a number of years. The effort was to modify for the small gas works the earlier achievements of the coke oven and large gas oven, including the "combination" feature which permits choice between producer gas and oven gas for under firing. The resulting designs were first tried out by the Koppers company in a battery of five of these ovens which have operated for two years at the plant of its subsidiary, the Seaboard By-product Coke Company, Jersey City, New Jersey.

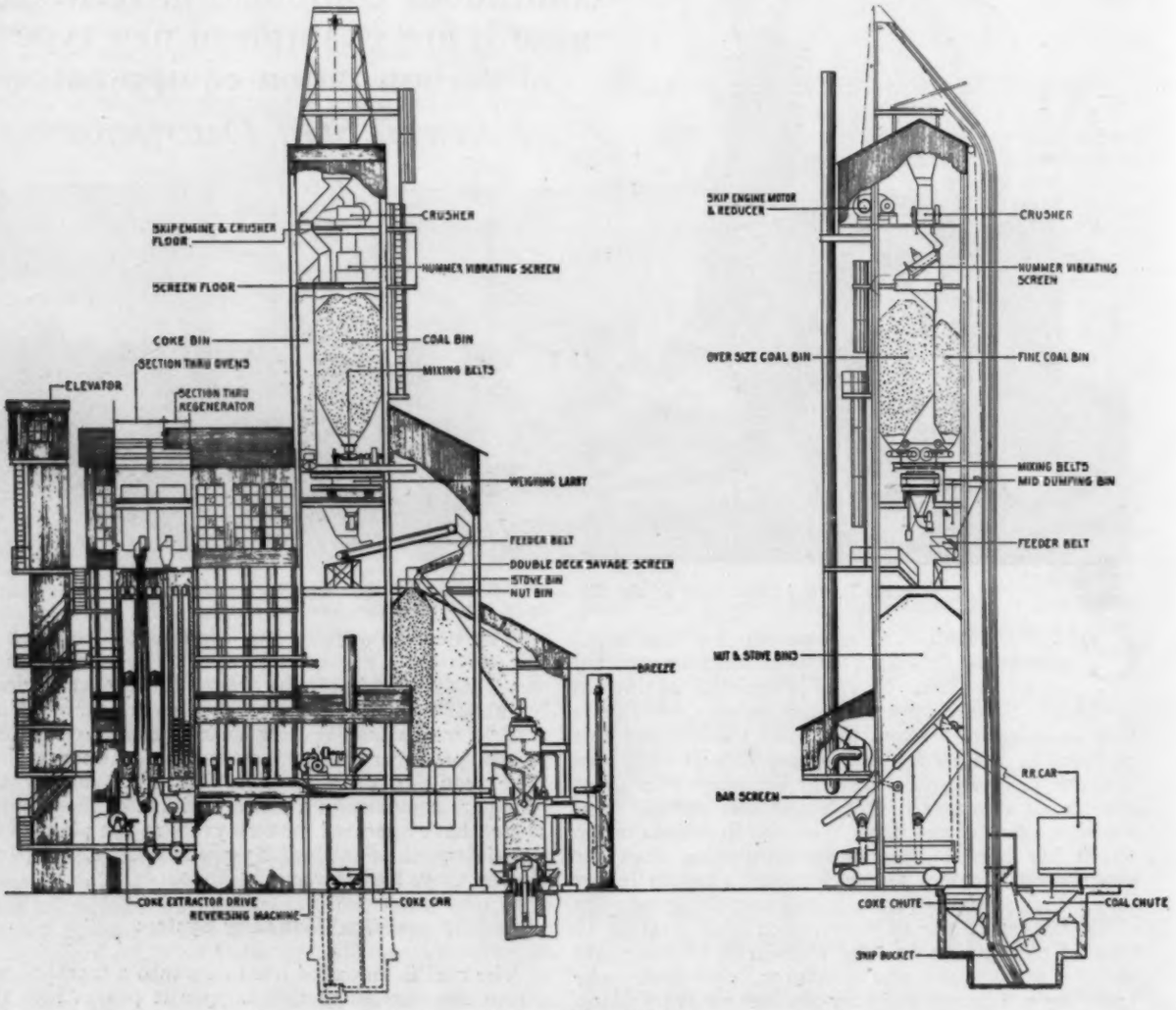
Coal-Handling System

The coal is unloaded from cars into a trackhopper. From the bottom of this hopper it passes into the bucket of a skip hoist and is elevated to the top of the coal handling system which feeds the coal to a roll crusher set to 1¼ in. After crushing, the coal descends to a ¾ in. vibrating screen where it is separated into coarse and fine sizes which fall to separate bins. From the bins, which are located at the end of and above the ovens, the two sizes are withdrawn at a predetermined ratio to a mixing belt and pass to a weighing larry car from which the operator fills the coal magazines located on the top of the ovens. A careful record is kept of the weight of the coal charged to each oven. This method of charging insures the detection of any operating irregularity since the weigh larry shows how rapidly each oven is taking coal.

The separation of coarse and fine coal, with sub-

sequent proportioned remixing, is a new development of importance. The size of coal charged has an important bearing on the rate of carbonization, on the path of gases leaving the coking zone, and on the character of the coke produced. When the ratio of coarse to fine coal is left to chance, the whole oven operation is subject to fluctuations caused by variations in the coal as received and by segregation of sizes in the oven bins. This cause of irregularities has been completely eliminated at the Sterling plant.

It should also be noted that in this installation, run of mine coal is used and it is unnecessary to reject any of the fine coal. This is a distinct advantage as in some cases of vertical retort operation it is absolutely necessary to reject as unfit for use large quantities of fines.



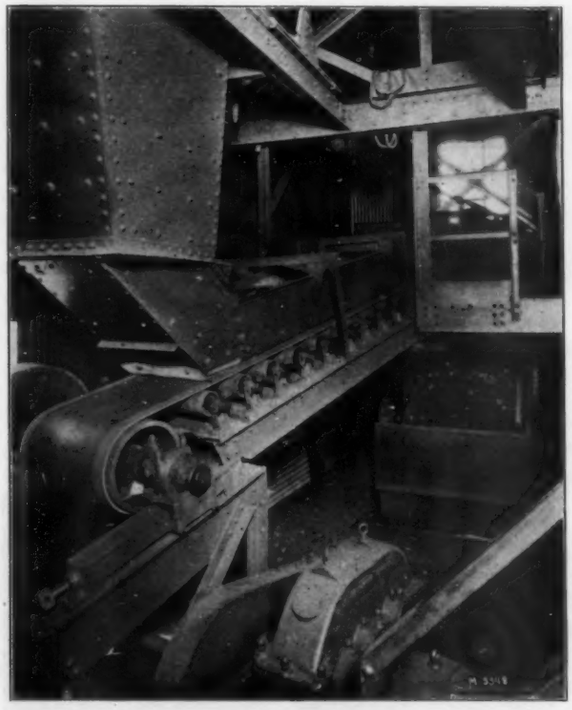
Sectional View of Plant

The Coking Chamber

The coal magazines hold approximately two hours supply and are so designed that coal is admitted without loss of gas. They are water cooled in order that the coal may remain cold and no preliminary softening and sticking can occur in the magazine and its bottom outlet. Coal feeds freely into the oven chamber as fast as coke is discharged at the bottom. Since combustion in the heating flues is initiated at the top of the oven, the oven walls have a relatively high temperature in this region. The coal which comes in contact with the walls at this point is at once seared over and coked, so that the coal mass shows no tendency to stick or hang up.

The free downward movement of the coking mass is further aided by using an oven chamber of large cross-sectional area, which results in a large ratio of coal weight to oven surface in contact with the coal. The various characteristics of the oven which have made this smooth and easy descent of the charge possible, have also permitted the use of a greatly reduced vertical taper, allowing for much less disturbance of the coal and coke mass while gravitating down through the ovens. These novel features are

believed to ensure an improved formation in the lower part of the oven on account of the absence of channeling of steam along the walls. Neither the coal nor the coke hangs in these verticals; in fact the



Coke Screening System

Sterling plant has been operated continuously with absolutely no poking or barring down of any kind though operated on a variety of coals.

Refractory Construction

The entire oven chamber and heating wall structure is composed of silica brick of rugged construction. The oven structure is surrounded by a 2-inch layer of compressible and refractory insulating material, retained by an asbestos board which is in turn covered with a 2-inch layer of insulating concrete. This construction, by giving a high degree of heat insulation, reduces radiation losses to a minimum, improves working conditions, and is unaffected by expansion or contraction of the oven structure proper. The frequent pointing up of exposed brick work common with some vertical installations is not required with this system of construction, even during heating up.

No refractory material is exposed at the base of the ovens, since they are supported on brick lined steel castings spreading from oven to oven, provided with ingeniously designed expansion joints which prevent the possibility of gas leakage and stay tight without any pointing being required.

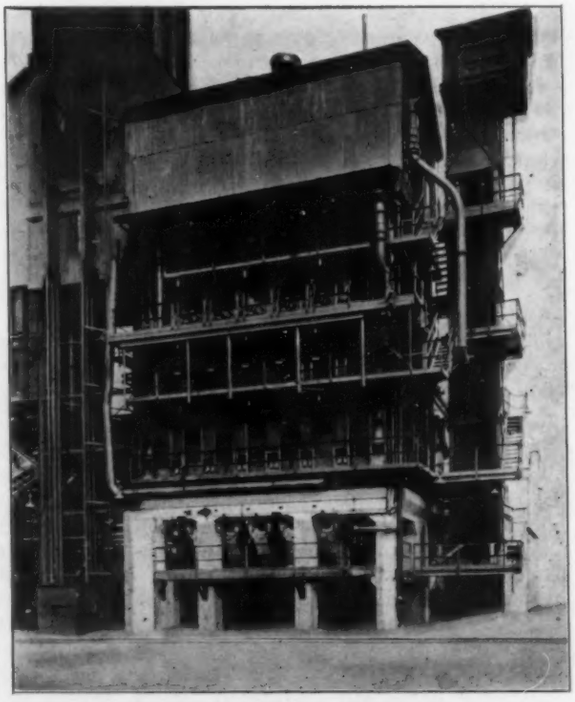
The coke is quenched at the bottom of the oven by adjustable water sprays located just above the extractor. The steam resulting from the quenching of the coke passes up through the charge in the oven and is used in the formation of water gas. As the coke leaves the oven quenched and dry, all the heat is retained in the oven.

The moving element of the coke extractor consists of a variable speed shaft upon which star-shaped castings are set so that their projecting lugs form helical lines. The action of the extractor element consists rather in permitting regulated quantities of coke to roll over it, than in grinding or forcibly tearing chunks of coke from the charge. After passing over the extractor the coke falls into an iron receiving hopper which is sufficiently large to hold approximately two hours run of coke when the ovens are operated at maximum speed. This hopper is closed by a gas-tight, water-sealed door. At intervals of about two hours the coke is discharged into a small dump-bottom car, which moves on a track below the ovens.

The coke car discharges its load into a receiving hopper and thence to the bucket of the same skip hoist that serves to elevate the coal to the ovens. The coke is elevated to a dump hopper from which it passes to a double deck shaking screen where it is separated into three sizes, over 1½ in., between 1½ in. and ¾ in., and under ¾ in. Adjacent storage bins receive the two larger sizes, while the coke under ¾ in. is either sent to the bin above the gas producer or to stock.

Regenerative Heating

The Koppers type vertical is the first continuous vertical oven in the United States to be built with



Oven Side of Battery

a regenerative heating system. Regenerative heating, which is thoroughly established in the coke oven industry, is claimed to have superior efficiency as contrasted with recuperating heating or heating with hot, uncleaned producer gas in the following particulars:

1. No periodic plant shut-downs for cleaning the gas passages, ports and relining of attached producers.
2. No heat losses and operating difficulties caused by leakage between air, and waste gases flowing in adjacent recuperator channels, separated by necessarily thin walls.
3. With a self clinkering outside producer, the producer gas is extremely uniform in quality, and is delivered at a constant pressure, so that uniform combustion conditions can be maintained indefinitely.
4. The supply of air and cold, clean producer gas are controlled by sensitive regulators and distributed through outside metal valves, which allow the closest possible regulation of combustion conditions, and eliminate the operating difficulties incident to the use of sliding brick dampers in hot, dirty gas.

The Heating System

The heating system used on this new vertical oven is completely flexible and adaptable to any fuel gas. Producer gas, coal gas, and water gas have all been tried out and proven satisfactory with such ovens. A switch from producer gas to coal gas or blue gas is only a matter of a few minutes, and some of the ovens can be heated with coal gas while others are being heated with producer gas. This enables the plant to prepare for and take care of peak loads with a minimum holder capacity.

A 7-ft. Koppers gas producer has been provided to underfire the Sterling ovens. Using coke and breeze under ¾ in. in size, it furnishes a gas of uniform grade, in quantities exactly and instantly adjustable to the rate at which it is desired to run the verticals. This gas after cooling and cleaning is furnished at a constant pressure and at uniform heat value, making it possible to obtain practically theoretical combustion in the oven flues at all times. With such gas there is no possibility of clogging gas passages and regenerator checker work. The single producer has sufficient capacity for double the present oven capacity.

The Regenerators

The regenerators are located at the ends of the ovens, opposite the collecting mains and integral with the flues. They extend the full height of the oven and are divided longitudinally through their height to permit the separate preheating of producer gas and air. These regenerators are filled with checker brick so set up as to present a large ratio of surface to mass for the absorption of heat from waste gases and the release of this heat to incoming gases. They are built so as to form long tubes which offer the least amount of resistance to the flow of gases.

A very important feature in design is that each heating wall with its two regenerators is built as a unit, the expansion joints passing through only the oven-chamber walls and leading to the outside. These expansion joints are filled with a compressible refractory material which effectually seals the joints without pointing and will last as long as the oven structure.

Producer Gas Heating

When heating with producer gas, this gas and the air are preheated by passing through adjacent regenerators; a portion of the gas and air is distributed to the top group of six vertical heating-flue sections, while the remaining gas and air is conducted down to the lower group of six vertical heating-flue sections. The flames burn downward in all flues and the products of combustion combine at the bottom of the heating wall, pass around the oven, rise through the flues of the opposite heating wall, and finally give up most of their remaining heat as they distribute downward through the two regenerators attached to this heating wall before passing to the stack.

Coal Magazine and Weighing Larry

If oven No. 1 is being heated with producer gas and combustion is occurring in No. 1 heating wall, cold, clean producer gas is being admitted at the base of No. 1 regenerator, and air for combustion at the base of No. 2 regenerator. The producer gas and air are preheated to about 2,000° F. in the brick checker work of their respective regenerators, after which they pass into separate top horizontal flues. The producer gas and air pass into the upper six vertical heating-flue sections through separate ports in each flue section and the flames burn downward. The angle and distance at which air and gas meet in each flue can be easily regulated by means of a deflector brick. The products of combustion from these flue sections are conveyed through passages in the lower section of the heating walls (small elliptical ducts in the left half) to a bottom horizontal flue.

A portion of the preheated producer gas and air which entered the top of the oven is separately con-

ducted to the lower group of six vertical heating-flue sections through small elliptical ducts in the upper section of the heating wall. The products of combustion collect in a separate horizontal flue at the base of the oven. Up to this point the products of combustion from the upper and lower sections of the heating flues have been kept separate, and the amount of gas burned in the upper and lower sections of the heating wall is under complete control by means of a single sliding brick in each of the respective lower horizontal flues of each heating wall. The waste gases combine in the cross-around flue from which they distribute through the opposite heating wall, and through No. 3 and No. 4 regenerators, as already described, into the stack. The upper and lower sections of the heating flues meet in such overlapping proximity to each other, and are so interwoven with the ducts leading hot gases to the lower sections and from the upper sections, that the active heating faces of the heating walls are substantially uninterrupted, and the flues in effect continuous, from top to bottom of the coking chambers.

After 30 minutes heating, an electrically driven mechanism actuated by a simple control attached to the coke extractor drive reverses the order of heating. Cold producer gas and air then enter No. 3 and No. 4 regenerators respectively, always in such order that there is no counterflow between fuel and waste gas, and burn down in No. 2 heating wall, while the hot products of combustion pass up through No. 1 heating wall, and out through No. 1 and No. 2 regenerators.

Coal Gas Heating

When coal gas is used for underfiring, only the air needs to be preheated. Air for combustion enters the base of both regenerators of the heating wall in which combustion is occurring, while coal gas is supplied through horizontal passages above each set of vertical heating flues. The coal gas gun for the lower set of flues is built with the brickwork. When using coal gas the temperatures in the upper and lower part of the heating wall are controlled by adjusting the pressure in the two mains supplying coal gas. Inspection caps at the top and bottom of the oven structure permit inspection of combustion conditions in each vertical flue at any time from top and bottom.

To change a pair of walls from producer gas heating to coal gas heating, it is only necessary to close the hand valve on the producer gas line leading to the gas regenerators of the two walls, to hook up the air valve to the reversing mechanism, and open the hand valves on the coal gas lines leading to the two guns.

The By-Product Recovery System

The raw coal gas leaves the oven through an offtake near the top and is sprayed with clean ammonia liquor, which cools the gas to 100° C. and flushes the pipes and mains so that no pitch is formed. The gas passes under suction through a butterfly valve operated by a gas governor which regulates the pressure to within 1 millimeter of the desired setting.

The cooling and condensing equipment is standard, consisting of an indirect water-tube cooler, P. and A. tar extractor, and hot drain tank. This tank has tar separating, flushing liquor, and dehydrated tar compartments, built into one compact unit, of such capacity that tar and liquor need to be pumped to storage only once daily. The ammonia is concentrated and marketed as liquor.

By-Product Yields and Operating Results

A typical analysis of the Black Mountain Coal No. 5 seam, Harlan County, Kentucky, used at the Sterling plant is as follows:

Moisture as charged.....	2.5%
Volatile matter.....	37.4%
Fixed carbon.....	58.4%
Ash	4.2%
Sulphur	0.6%

Using this coal, the following average results have been obtained at Sterling, the figures being based on the carbonization of a net ton of coal of 2.5% moisture content:

Gas yield	12,630 cu. ft.
Tar yield	14.3 gallons
Total coke	1,360 lbs.
Coke used in producer...	171 lbs.

The gross heat in the gas is 3,671 B.t.u. per pound of dry coal carbonized. The gas made has a heating value of 567 B.t.u. per cubic foot, maintained thus to meet legal requirements of the State commission. This figure can, of course, be varied with the amount of water gas made by the reaction of steam with red hot coke near the base of the ovens. All the steam generated in quenching the coke rises through the oven chambers and additional steam may be used, or steam exclusively for quenching, depending on the B.t.u. requirements of the sendout gas.

The coke produced at Sterling is of excellent quality and is much better than was formerly obtained from the same coal in horizontal retorts; the breeze made is less than 5% of the coal. The coke is being readily marketed as domestic fuel; it will also be used for water gas manufacture.

Advantages Anticipated

This type of continuous vertical oven can be operated with low labor costs, as a plant up to 2,000,000 cubic feet daily capacity requires only three men per shift, with a foreman on the day shift only. This labor can care for the ovens, the by-product system and the fuel-gas producer.

Under normal operating conditions a plant of this type should have a life of at least 15 years without any repairs to the brickwork. This of course means low maintenance cost and materially contributes to low operating costs, in view of the fact that operation will not be interrupted due to shut-downs, repairs, and replacements common in plants of lighter construction. It is characterized by the same sturdiness of construction, the same flexibility in heating and the same basic principles of design as the Becker Type horizontal oven.

It is designed so that it can be heated either with

clean, regeneratively heated producer gas, coal gas or blue gas, offering a flexibility not usually available in plants designed for small capacities. This feature, combined with the natural adaptability of the vertical oven for steaming, gives a flexibility and control to meet the most widely varying demand.

The American Gas Association Hub and Spigot Pipe Joint

By Alten S. Miller

Vice-President, The Bartlett Hayward Company

AT a recent meeting of the Distribution Committee of the American Gas Association the hub and spigot pipe joint came up for discussion and there was a decided difference of opinion regarding the action of the joint and the function of the lead and yarn in holding the gas. At the same time it was suggested that it would be avisable to modify the American Gas Association standard joints. For this reason it would not seem out of place at this time to give briefly the history of the design and the reasons for its adoption. If the original theory of the action of this joint on which the design was based is wrong, possibly a change in its form may be desirable, but a change should not be made until there is an agreement regarding the action of the joint and until experiments have proven that something else is better.

Many Experiments Made

About 1896 there was referred to the technical committee of the American Gas Light Association the question whether or not it was advisable for the association to adopt the standards of the Society of Gas Lighting of New York. Before reporting many experiments were made with joints made according to the design of the Society of Gas Lighting as well as the type used on water pipes and other forms easily manufactured and assembled.

In studying the joints it was assumed that the joint would act as a stuffing box in which there would be longitudinal motion sufficient to abrade the lead and to break any joint that the lead might make with the pipe when the joint is first caulked. The assumption was also made that the differential expansion between the cast iron of the pipe and the lead would loosen the latter and that the gas is held entirely by the yarn.

The experiments seemed to bear out the assumption and the lead crease suggested by the committee and adopted as the standard was indicated by the experiments to be the best for the purpose.

In making the joint the workmanship and materials are important. The yarn should be impregnated with a filler that will not destroy its elasticity and will not dissolve in gas. This point seems fully understood by the engineer in packing joints to hold oil and water, but is usually overlooked in packing joints to hold gas. The ordinary yarn contains a substantial amount of oil and it is easy to make with it a joint that at first is gas tight. Eventually the oil is dissolved by the gas and a large proportion of the joints begin to leak. If tarred yarn is used, the same condition prevails. Soap is commonly used as a filler for packing to hold oil or gas and works very satisfactorily.

The yarn should be well driven into the hub with the proper tool and hammer. The compression should be carried to a joint that will cause the hammer to bounce actively from the head of the yarning tool. The yarn should be deep enough to reach the bottom of the lead crease, which is an inch and a quarter from the face of the hub.

If the yarn is properly driven, cast lead is most satisfactory as a gland to hold it in place. The lead should be soft and free from tin or other metals that will harden it. It should be driven well, but care is necessary to prevent splitting the hub.

It is frequently difficult to impress those responsible with the necessity of properly compressing the yarn. It is a great advantage in the use of lead wool instead of case lead that, provided too much is not put into the joint in the beginning and it is properly consolidated, the yarn is necessarily compressed in the process of caulking. There are other advantages in using lead wool, but this particular one seems to outweigh all the others.

Cement Joint

It may be well to refer briefly to the rigid or cement joint. For each degree fall in temperature cast iron pipe rigidly held is strained in tension eighty-eight and a half pounds per square inch of sectional area of cast iron and each degree rise in temperature strains it eighty-eight and a half pounds in compression. The datum temperature in every case is that at which the joint was made. This expansion and contraction causes many joints to fail before the cement has its final set, and others in extremely cold weather months or years after the joint is made. There is a very small factor of safety, if any, when a 12-inch or 16-inch pipe made up with cement joints is cooled 20 to 30 degrees below its temperature when laid, though engineers ordinarily demand such a factor to be from six to ten in other types of construction.

Like lead joints, cement joints are never satisfactory unless made properly and with proper mate-

rials. In addition the cement joint should be made in cool weather and both the pipe and the joint protected from the direct rays of the sun. When the cement joint is made it should be allowed to set quite hard before the trench is refilled, in order to avoid the risk of disturbing the joint in refilling and tamping.

About three decades have passed since the present hub for lead and yarn was adopted, and it would not be amiss to study the design critically. Before making any change, however, the members of the industry should agree on the method of making the joint and the ways in which the joint acts. This having been done, alternate designs may be easily tested by moving spigots in joints with hydraulic jacks as was done when the present design was adopted. It is also easy to study the lead before and after caulking by slipping out the spigot and taking out the lead ring. This also gives a chance to examine yarn driven in different ways. The entire subject will bear much study and is well worth the trouble.

Executive Board of the American Gas Association

Left to Right—A. L. Tossell, A. B. Macbeth, W. E. Steinwedell, J. B. Klumpp, T. R. Beal, H. C. Clark, Alfred Hurlburt, O. H. Fogg and H. O. Loebell

Left to Right—Alexander Forward, Arthur Hewitt, K. R. Boyes, C. A. Munroe, R. M. Leach, G. W. Parker, R. B. Brown, C. E. Paige, B. J. Mullaney, J. J. Burns, F. A. Lemke, C. D. Jackson, P. H. Gadsden and G. B. Cortelyou

Association Activities

A. G. A. and affiliated gas associations' sectional activities and convention calendar

Laboratory to Get New Building

Plans for a new and larger building for the American Gas Association Testing Laboratory at Cleveland, O., have been approved by the executive board of the A. G. A. Work on the new structure will start within a short time, and by September 30, 1928, it is hoped all research and testing activities of the Laboratory will be housed in a new and efficiently arranged building of more than 21,000 square feet.

The following report was submitted to the executive board by a committee consisting of James Lawrence, chairman; R. W. Gallagher, O. H. Fogg, W. C. Beckjord, R. R. Young, J. S. DeHart, Jr., H. E. McGowan and H. M. Brundage, and was approved:

"The special committee appointed by the president in accordance with a resolution adopted by the board at its meeting of June 5, 1927, have conferred at length respecting the desirability of the acquisition of a parcel of land and the creation of a building in the City of Cleveland, O., to be utilized, together with its equipment, as a testing and research laboratory.

"From our knowledge of the necessity for this improvement and from data submitted at the meeting, we are unanimously agreed that the plans as outlined, including the larger building with approximately 21,000 square feet of floor space, should be provided. The estimated expenditure, including the removal of the present equipment to the new building, will approximate $145,000.

"We are further agreed that the Laboratory, having demonstrated its value to the gas industry and being now in a crowded condition and furnishing inadequate facilities to accomplish the many tasks needed, both present and prospective, that the American Gas Association cannot afford to allow its work to lapse or be retarded, but must necessarily push on to even greater accomplishments. The proposed addition will not only do this, but will provide more efficient methods to accomplish the desired end."

The Laboratory has expanded so rapidly during the last year, due to the splendid support by both manufacturers and gas companies, that several of the testing departments are badly crowded at present, and additional space is necessary for the efficient functioning of testing programs already approved.

The Laboratory is now testing four major types of domestic appliances, conducting research work on mixed gases, and completing other investigations necessary in the preparation of new requirements and the revision of old ones. These activities have taxed present facilities to the limit, several divisions, notably the water heater and central house heating sections, are hampered with lack of space, and the entire organization will be able to function more efficiently and with less lost motion when more adequate space is available.

At the present time the Laboratory occupies, for office, storage and testing purposes, approximately 12,000 square feet of floor space. According to estimates, about 20,000 square feet will be necessary by 1930, and the new building is being planned to adequately care for demands for the next three years, with provision made for the addition of an additional floor if it be needed in the future.

The manufacturers will benefit materially from the new building. Whereas, in the past a small workroom has been set aside for the manufacturers to work in, as many as ten representatives a day call in connection with the testing of their products. Some of them wish to connect their appliances and make the corrections required without having to incur the expense of sending the appliancess back to the factory, and to eliminate valuable loss of time.

Ample space will be provided in the new building for this purpose.

That this service is appreciated is apparent from the many letters of appreciation received by R. M. Conner, director, and in his opinion it is the forerunner of a more important service when a department will be started for manufacturers to use as an experimental station.

The new building will be erected on ground near the present building in Cleveland, O. The site will be purchased from the East Ohio Gas Company, which has given the Laboratory such splendid assistance in the past two years.

The new building will be of brick construction, with face brick throughout the front wall. The main support for the floors will be structural steel.

CONVENTION CALENDAR

October

6-7—Empire State Gas and Electric Association. Annual meeting, Lake Placid Club, Lake Placid, N. Y. C. H. B. Chapin, secretary, Grand Central Terminal Building, New York, N. Y.

10-14—American Gas Association. Annual meeting, Stevens Hotel, Chicago, Ill. Alexander Forward, managing director, 420 Lexington Ave., New York, N. Y.

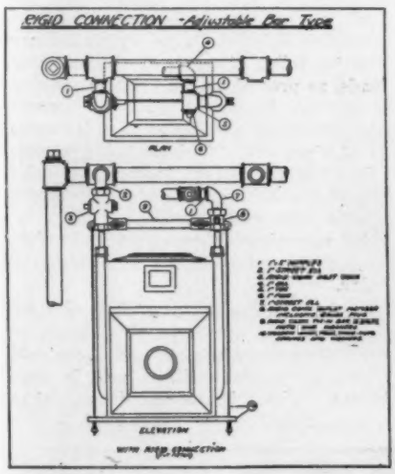
R. M. Conner

Some High Lights From P. C. G. A. Convention

Excerpts from Committee Reports Presented on Certain Technical Subjects

Rigid Meter Connections

The committee on rigid meter connections of the Pacific Coast Gas Association, working under the chairmanship of D. E. Farmer, during the past year has undertaken to glean the experience of many companies regarding the advantages of this type of support. The committee in its report recognizes that providing of satisfactory meter connections is one of the most important problems of the distribution department of a company. "Leakage and restricted flow at these points are not only prolific sources of service complaints, but they further represent items of considerable repair expense and loss through unregistered leakage."



Among the salient points expressed as a concensus of opinion from their inquiries the committe gives the following:

1. By removing strain from the meter spuds and tubes, leakage at these points had been eliminated, except in cases where meter was bumped or otherwise damaged by storage of fuel, moving freight, etc.

2. Leakage due to shrunken washers in the meter swivel connections had been very materially reduced, particularly where the adjustable shelf with tension spring or wing nuts was used. Several companies reported that the pressure exerted by these springs or nuts was sufficient to maintain a gas-tight union between swivel and meter spud even after the female cap on the swivel had been entirely removed.

3. By installing rigid connection at time service is run to building, plumbers are given a definite point to which house line must be run, thus eliminating the tie-in work usually found necessary by the meter setter.

4. Use of rigid connections will permit of assembly of standard meter set fittings in the shop, where better facilities are available than on customers' premises.

5. Uniformity in single or battery installations tends to present a more workmanlike finished connection.

6. Use of rigid connection hampers and complicates efforts to install illegal connections.

Three types of rigid connections suggested by the committee are illustrated.

Natural Gas Measurements

Measurement of natural gas with orifice meters was the major subject considered by this committee of the Pacific Coast Gas Association, which worked under the chairmanship of F. A. Hough, of the Southern Counties Gas Company. Salient points from the committee's report are quoted:

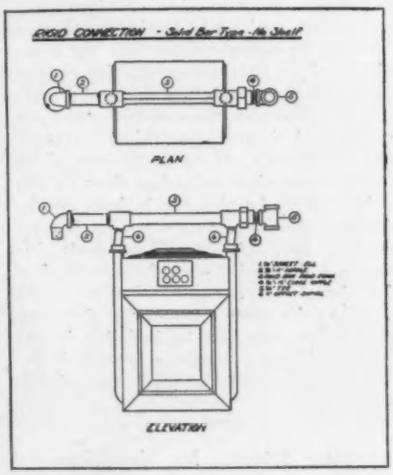
"It has been the almost universal practice in the natural gas industry to use as a unit for gas measurement one cubic foot of gas at a temperature of 60° F. and at a pressure 4, 6, 8 or 10 ounces above the normal barometric pressure at the point where the gas is measured. Obviously changing the pressure to which gas measurements are referred changes the actual quantity of gas (expessed in weight or heat units) in unit volume. Thus we see that it has been the practice of the natural gas industry to actually use a different unit of measurement for each elevation above sea level."

In addition to the confusion that may arise because of the multiplicity of ways of interpreting and expressing orifice meter measurements illustrated above, further confusion arises from the fact that in many cases companies do not agree as to what the normal barometric pressure is at a given point. Investigation by the committee disclosed the fact that in every oil field in Southern California at least two values for the normal barometric pressure are in common use; in some cases there are as many as three values in use. These values range from 14.4 to 14.65 lb. per sq. in. Although this is a small range or variation, under the present method of actually changing the pressure base, to which gas measurements are referred to conform with the barometric pressure, this small difference changes the volumes obtained by 1.4 per cent.

In view of these pacts the committee on gas measurements believes that much could be gained and little or nothing lost if, instead of following the present practice of changing the standard pressure to which gas measurements are referred for changes in barometric pressure, the natural gas industry would choose some standard pressure that could be universally adopted, just as the present standard of temperature is universally adopted. The committee's contention is that if we are to have a standard practice it should be one that makes the measurements of gas by means of orifice meters as simple as possible, and the results as useable as possible. The prime requisite in measurement work of any kind is a definite reproduceable unit, something that the natural gas industry does not now have.

The question as to just what pressure should be chosen for universal use is a difficult one because of the conflicting interests involved. From the purely technical point of view it would be desirable to have natural gas measurements conform to the universally accepted pressure standard now used in gas testing work, namely 30 inches of mercury (14.733 lb. sq. in.).

The committee on gas measurements for 1926 investigated the moisture content of natural gas. Their report on this subject was devoted largely to a discussion of methods correcting gas volumes for moisture content when the gas is saturated with water vapor. The estimation of loss of volume during the compressing of gas saturated with water vapor was covered quite thoroughly by that committee. The committee this



year will confine its report on water vapor correction to a discussion of methods of determining the water content of gas when the gas is carrying more or less water than that required for saturation and to a study of the effect of entrained liquid water on orifice meter measurements.

When the work of the measurements committee for 1927 was originally out-

lined, the study of gas measurements under pulsating flow conditions was to be our chief problem. Preliminary work on this subject convinced the committee that no work of value concerning that subject could be completed during the few months interim between the time the committee was organized and the time our report had to be made. The committee has, therefore, undertaken a program of work on pulsating flow with the idea in mind that the work would extend over a period of at least two years. Endeavoring to profit by the experience gained by previous measurement committees that have studied the pulsation problem and by experience gained in actual practice in the field, the committee is first tackling their problem from the mathematical and theoretical side. Previous work has demonstrated that there are so many variables encountered in the measurement of gas under pulsating flow conditions that results obtained during flow tests even at one meter where apparently all conditions remain constant are often erratic. Rather than try out more or less blindly a number of different devices for eliminating pulsating flow, the committee is attempting to learn the characteristics of pulsating flow so that devices for its elimination can be designed intelligently.

As the first step in their experimental work, members of the committee have designed a so-called photo-pulsometer. This instrument will serve as a detector of pulsating flow, showing definitely that it does or does not exist at the point where the test is made. It also makes it possible to determine the frequency and velocity of wave motions and may possibly be calibrated so that the magnitude of the pressure or velocity change accompanying each wave can be estimated. However, the committee has not as yet had time to test this instrument out thoroughly, or to carry any of its work concerning pulsating flow to the point where definite conclusions can be drawn. For that reason no further report on that subject will be made this year. A detailed report of the work thus far done together with further work done on the same problem by the committee for 1928 can be included in the report of that committee in case it decides to carry on the work started this year.

Color Schemes for Pipe Lines

A. B. Newby and his associates on the compressor plant committee made preliminary recommendations regarding color schemes for pipe lines. This was in response to a request that a uniform color code for identifying lines in compressor plants be provided. The committee presents the following as a part of its conclusions

After considerable discussion, the committee decided that the color scheme should include the entire gas plant. This makes it quite a different problem from the original. The committee offers the following color scheme for discussion, but believes that this problem should be studied for another year before adopting a Pacific Coast Gas Association standard:

Air Lines	Dark Lead
Drinking Water	Light Green
Exhaust Steam	Light Brown
Vacuum Gas Lines	Dark Drab
Gas Intake Lines, first stage above atmospheric pressure	Dark Brown
Intermediate Pressure Gas Lines, first stage discharge and second stage intake	Aluminum
High Pressure Gas Lines	Bronze
Light Oil Lines	White
Live Steam	Bright Yellow
Oil Lines	Black
Plant Water	Light Blue
Drains	Maroon
Tar Lines	Pearl Grey
Vent Lines	Grey
Wash Oil Lines	Dark Blue
Fire Lines	Red

It is extremely difficult to obtain a color scheme for a large number of different lines that has sufficient contrast between the various colors. Therefore, it is necessary to keep the different lines to be identified to a minimum. If every line in the plant were identified, the color scheme would be so complicated that it would defeat the purpose.

The following lines should be identified in a natural gas compressor plant:

Vacuum Gas Lines.

Gas Intake Lines—first stage above atmospheric pressure.

Intermediate Pressure Lines—first stage discharge and second stage intake.

High Pressure Gas Lines—second stage discharge.

Air Lines.

Plant Water Lines.

Fire Lines.

There are other lines in a compressor plant that may be identified, but the lines mentioned above need identification more than the others.

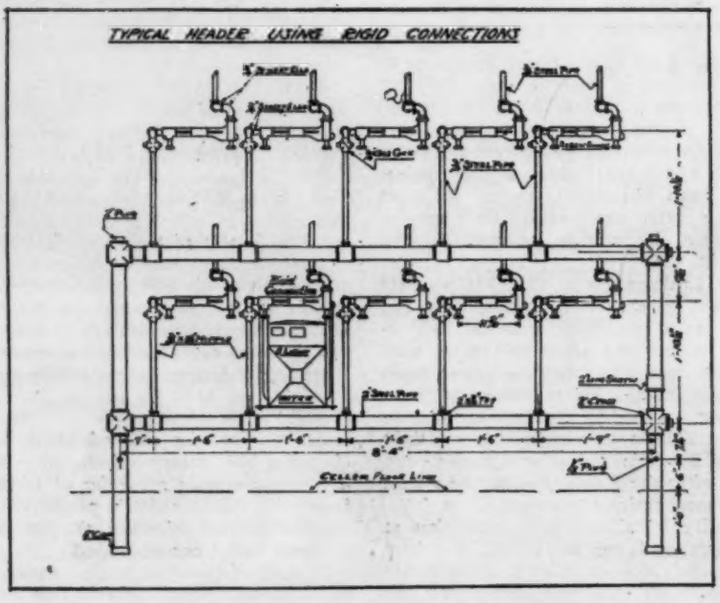
Liquid Purification

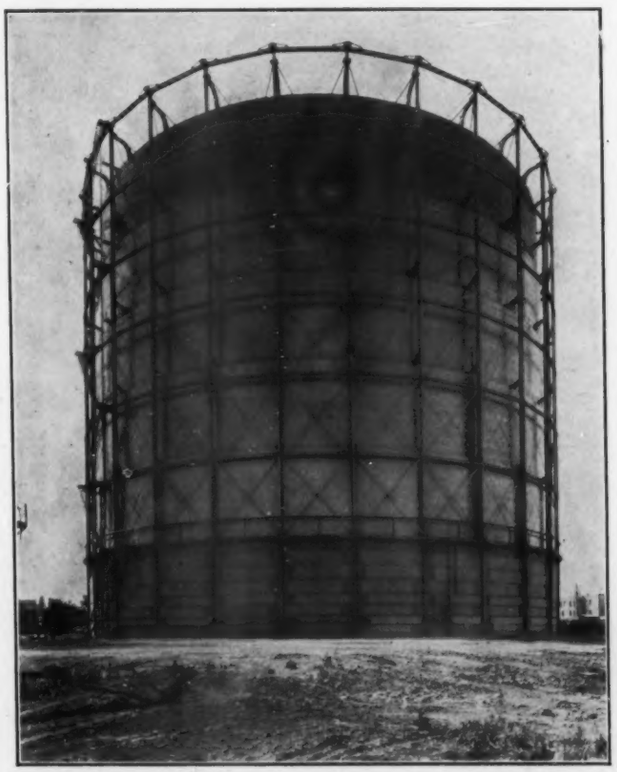
The problem of liquid purification of gas on the West Coast involves important considerations as to sulphur disposal. This lent special interest to the work of the committee on this subject which reported through its chairman, K. N. Cundall. Salient points in their comments are as follows:

The sulphur recovery process of today is a decided success. It will remove between 95 and 100 per cent of the hydrogen sulphide in the gas and convert it to free sulphur. This high efficiency can be relied upon even during peak loads, as proved by the average removal at the San Francisco plant for November, December and January, which came to 95.9 per cent. This is being accomplished at the present cost of 7.2 mills per M cu. ft. for 260 grains gas, which is less than when using iron oxide, besides returning an excellent by-product of increasing insecticidal and fungicidal value.

In fact, during the past eight months, figured on the dry basis, 40 carloads, or over 900 tons of sulphur have been sold with a like amount still on hand in three plants. With this amount of material to

(Continued on Page 66)





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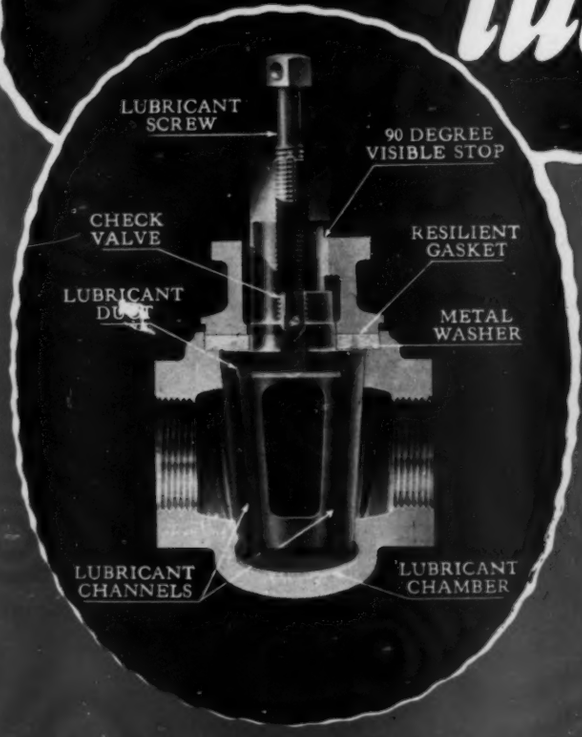
Capacity 16" to 22" pipe 4 1/2 miles *per day*

Why should a valve be lubricated?



Without proper lubrication the metal to metal surfaces within valves are subjected to direct wear, encouraging intrusion of foreign matter to the frictioning surfaces. In Merco Nordstrom Plug Valves a film of lubricant envelopes the plug. This lubricant, under positive pressure, releases the plug against the compression of the gasket—and yet the plug is never separated from its seat sufficiently to allow entry of foreign matter.

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Petroleum Engineers recognize the superiority of these valves and are adapting them to countless services—on all types of gas and distribution lines, boilers, acid and caustic lines, steam and water lines, etc.

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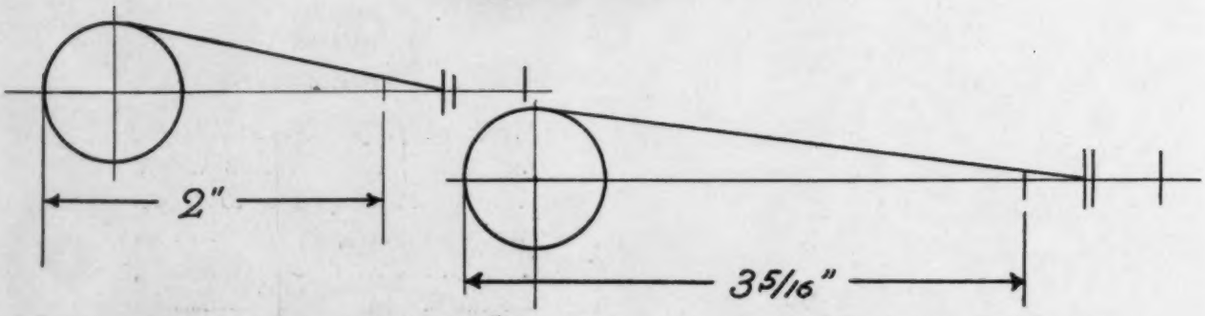

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The D-slide valve, used continuously in meter construction since 1858, was taken from steam engine design and the valve arm demonstrates a curious phenomenon known as the angularity of a connecting rod. Expressed in the language of the gas meter, this means that the longer the arm in proportion to the diameter of the crank circle (i.e., valve travel), the more equally the valves may be "divided."

The guaranteed minimum capacities are:

5-A	175	cubic feet per hour
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60-A	1500	" " " "
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The whole range of customers' demands are met by carrying only five sizes of meters in the stock room.

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The Convention Program in Outline

MONDAY

2 P. M.—Manufacturers Section

Business session and committee reports.

Paper: "Laboratory Developments," R. M. Conner.

8 P. M.—Industrial Gas Sales Conference

Papers: "Surveys and How to Use Them," R. L. Manier; "Methods of Establishing Budgets or Quotas for Industrial Gas Departments," C. C. Krausse; "Salesmen's Reports," D. W. Chapman.

TUESDAY

10 A. M.—General Session

Officers' reports and business session.

Addresses: "The Industry's Program," President A. B. MacBeth; "The Laboratory—Today and Tomorrow," Ralph Gallagher; "The Engineering and Economic Program of the Gas Industry," H. C. Abell.

In Memoriam—W. J. Clark.

2 P. M.—Simultaneous Section Meetings

ACCOUNTING

Business session and reports.

Address: "The Accountant and His Big Job in the Gas Industry," Samuel Insull, Jr.

COMMERCIAL

Business session and reports.

Papers: "Are We Anywhere Near Saturation?" R. M. Searle; "What's Ahead in Domestic Cooking?" George E. Whitwell; "The Importance and Use of Commercial Statistics," T. H. Brown; "Large Volume Water Heating," H. J. Long; "Sales Possibilities in the Domestic Laundry," A. M. Evans; "1927 Developments in Gas Refrigeration," H. D. Valentine.

INDUSTRIAL GAS

Committee reports.

Papers: "Merchants Needed in the Gas Industry," Philip Cabot; "What Can Be Done to Accelerate the Industrial Gas Load?" J. G. Learned; "Value of Survey to Management," G. I. Vincent; "Servicing Industrial Customers," A. M. Apmann.

TECHNICAL

Business session and reports.

Papers: "Tests on Effect of Thermal Content, Specific Gravity, etc., on the Utilization of Various Gases and Mixtures," G. B. Shawn; "Mixed Gas From the Standpoint of Plant Operation," J. A. Perry.

WEDNESDAY

10 A. M.—General Session

Committee reports.

Addresses: "Essentials of Prosperity," James A. Emery; "Are We Doing Enough to Do More?" Samuel Insull; "The Public Services," Hon. J. F. Shaughnessey; "Executive Interest in and Responsibility for Sales," W. A. Jones.

2 P. M.—Simultaneous Section Meetings

ACCOUNTING

Committee reports.

Address: "Simplified System of Customers Accounting of The Peoples Gas Light & Coke Company," Paul H. Myers.

COMMERCIAL

Papers: "What Do Rates Mean to a Commercial Department?" T. F. Kennedy; "House Heating Developments During the Past Year," H. Leigh Whitelaw; "What You Go After You Get," Mrs. Anna J. Peterson.

Symposium: "The Influence of Salesmen's Compensation on Load Building," E. R. Acker, J. H. Hartog, Stanley Jenks, P. B. Wiske, John G. Learned.

INDUSTRIAL GAS

Committee reports.

Paper: "Resume of Outstanding Industrial Gas Installations Made During Year," H. A. Clark.

PUBLICITY AND ADVERTISING

Business session and reports.

Addresses, "The Public Interest in Transportation," R. H. Aishton; "Space Grabbing in Newspapers," B. J. Mullaney; "The Financial Stability of the Public Utility Industry," Henry R. Hayes; "The True Functions of Government," Cornelius J. Doyle.

TECHNICAL

Committee reports.

Papers: "Developments in Water Gas Operation," L. J. Willien, Louis Stein; "Some European Developments," G. M. Gill.

CHEMICAL PARALLEL SESSION

Committee report.

Papers: "Constitution of Coal in Relation to Spontaneous Combustion," Dr. W. Francis; "Coking and Swelling Constituents of Coal," R. T. Haslam; "Relation of Fusibility of Coal Ash to Clinker Formation," Bureau of Mines.

THURSDAY

10 A. M.—General Session

Committee reports. Presentation of Beal and McCarter Medals.

Addresses: "The Executive and the Industrial Load," C. E. Paige; "The New American Tempo," Robert R. Updegraf; "The Elimination of Fatigue," Dr. Lillian Gilbreth; "Passing Another Milestone," Arthur Hewitt.

2 P. M.—Simultaneous Section Meetings

ACCOUNTING

Committee reports.

Addresses: "Fixed Capital Records," James H. Walker; "Review of Accounting Section Activities," J. W. Heins.

COMMERCIAL

Papers: "The Commercial Value of the Testing Laboratory," Alfred Hurlburt; "The Blue Star Plan Today," R. J. Canniff; "Advertising for Greater Sales," J. R. Pershall; "Selling Incineration," W. R. Lacey.

Symposium: "Co-operative Merchandising," G. M. Karshner, H. D. Valentine, J. E. Davies, F. F. Capen.

INDUSTRIAL GAS

Committee reports.

Papers: "Forging," W. M. Hepburn; "Gas Economics of Brass Melting," J. F. Quinn; "Enameling," W. D. Thompson.

TECHNICAL

Committee reports.

CHEMICAL PARALLEL SESSION

Paper: "Effect of Method of Carbonization of Coal Tars," S. R. Church.

Symposia: Naphthalene Determination, Organic Sulphur Compounds in Gas.

Home Service Committee

On Tuesday, 2 p. m., Wednesday, 2 p. m. and 5.15 p. m., and Thursday, 2 p. m., there will be held important and interesting meetings of the Home Service Committee. All interested in Home Service matters are urged to be in attendance.

Women's Meeting

Thursday, 10 a. m.: Various prominent speakers will address the meeting presided over by Miss Julianne Doane, dean of women, The Peoples Gas Light and Coke Company.

Industrial Gas Inspection Trips

Monday—8.30 a. m., Deering Works of the International Harvester Company, Pettibone Mulliken Company; 1.30 p. m., McCormick Works of the International Harvester Company.

Wednesday—8.30 a. m., Kedzie Foundry, Liquid Carbonic Company.

Friday—8.30 a. m., West Pullman Plant of the International Harvester Company; 1.30 p. m., Crane Company.

Entertainment

Tuesday Afternoon—Sight-seeing trip and tea for the ladies at Edgewater Beach Hotel.

Tuesday Evening—President's reception and dance.

Wednesday Afternoon—Luncheon for the ladies at 1 o'clock at Hotel Drake; cards in the French room and foyer.

Wednesday Evening—Dancing in the main dining room of the Stevens, starting at 9.30.

Thursday Evening—Dancing in the main dining room of the Stevens, starting at 9.30. Buffet supper at 11.30.

Golfing—Arrangements will be made for golfing privileges for members of the A. G. A. and their guests at one or more of the Chicago courses.

Previewing the Exhibits at the Chicago A. G. A. Convention

BALLROOM

Name and Address — Booth

Abendroth Bros., Port Chester, N. Y..... 38
Gas ranges.

A-B Stove Company, Battle Creek, Mich..... 31
Gas ranges.

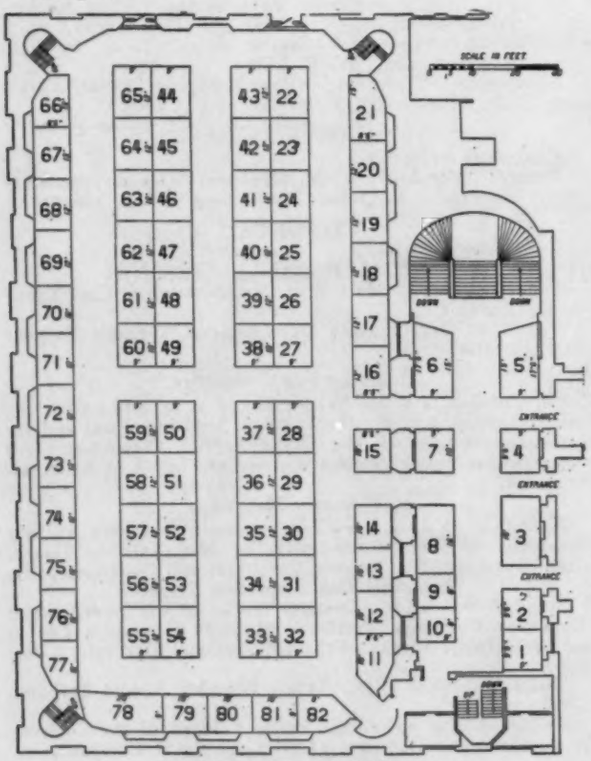
American Gas Journal, New York, N. Y..... 9

American Meter Company, New York, N. Y..... 64
Meters to measure gas in any quantity.

American Range Corp., Shakopee, Minn..... 57
Gas ranges.

American Schaeffer & Budenburg Corp., Brooklyn, N. Y. 10
Featuring American Gas Makers gauge for indicating very low pressures in gas plants. Perfect protection of gauge against overloads and no loss in calibration. Full arc dial of 280 degrees and graduations from 20 inches to 150 inches. Either back or bottom connection can be furnished. Sturdy and accurate.

American Stove Company, St. Louis, Mo..... 47
Ranges.



Booth Plan—Ball Room

Blodgett Co., Inc., The G. S., Burlington, Vt..... 69
Featuring our new improved 300-G Series, heavy insulated oven with automatic control.

Bristol Company, The, Waterbury, Conn..... 11
Featuring Automatic Safety Stop Valves for temperature and pressure control installations.
Also exhibit of Bristol's recording and indicating instruments and temperature and pressure controllers.

Carbide & Carbon Chemicals Corp., New York, N. Y... 56
Compressed gas for cooking for suburban and rural localities. Pyrofax provides service beyond the gas mains and offers field for sale of appliances.

Name and Address — Booth

Chaplin-Fulton Mfg. Co., The, Pittsburgh, Pa..... 51
Fulton governors.

Chicago Vitreous Enamel Products Co., Cicero, Ill..... 39
Manufacturers of enamels and enamel plant equipment.

Clark & Co. Div., Geo. M., Chicago, Ill..... 49
Manufacurers of Clark Jewel gas ranges; featuring the Lorain Oven Heat Regulator.

Cleveland Gas Meter Co., The, Cleveland, O..... 14
Meters.

Cleveland Heater Co., The, Cleveland, O..... 26
Rex Automatic Storage Water Heaters; Rex Automatic Storage Heater, hard water type, and Rex Hot Water House Heating Systems on display.

Connelly Iron Sponge & Governor Co., Long Island City, N. Y...... 7
Introducing several innovations, one being a diaphragmatic back pressure valve designed to lower diaphragm and close flap in case of suction on end of line.

Cribben & Sexton, Co., Chicago, Ill..... 78
Universal Gas Ranges. In-A-Drawer Broiler.

Crown Stove Works, Chicago, Ill..... 40
Crown gas ranges.

Dangler Stove Co. Div., American Stove Co., Cleveland, O..... 60
Do not miss the new style Dangler Gas Ranges. Fronts are hingeless and boltless, making them easy to clean. Ovens and broilers high, preventing stooping. Beautiful finishes.

Davis Emergency Equipment Co., Inc., New York, N. Y. 61
Resuscitating equipment.

Dearborn Chemical Co., Chicago, Ill..... 13
No-Ox-Id Rust Preventive.

Direct Action Stove Co. Div., Lorain, O..... 45
Direct Action Gas Ranges with Lorain Red Wheel Regulators. A complete line of modern gas ranges with the "direct type" gas and time-saving oven.

Dresser Mfg. Co., S. R., Bradford, Pa..... 52
Showing a large Dresser coupling, as used on either 36 inch or 48 inch C. I. pipe; also coupling for 3/8 inch steel pipe and intermediate sizes. Indestructible lead tipped gaskets also featured.

Electric Indicator Corp., Stamford, Conn..... 80
"Elinco" gas holder position indicating systems. Featuring new Remote Recorder and 30 inch indicator.

Elgin Stove & Oven Co., Elgin, Ill..... 58
Stoves.

Eriez Stove & Mfg. Co., Erie, Pa..... 6
Gas ranges.

Favorite Stove & Range Co., Piqua, O..... 4
Ranges.

Foxboro Co., Inc., The, Foxboro, Mass..... 35
Recording and indicating instruments.

Gas Machinery Co., The, Cleveland, O..... 28
Our booth will be fitted up with comfortable chairs where you can drop in at any time while the exhibit is open and make yourself at home. One or more of the following members of our organization will always be on hand: W. E. Steinwedell, L. C. Hamlink, Wm. Steinwedell, C. H. Hale, E. E. Witherby, C. H. Printz.

General Gas Light Co., New York, N. Y..... 70
Radiantfire heaters.

Glenwood Range Co., Taunton, Mass..... 23
Glenwood gas ranges.

Grayson Mfg. Co., The J. H., Athens, O..... 72
Ray-Glo heaters.

Griffin & Co., J. J., Philadelphia, Pa..... 68
Will feature a 150-A meter with all cover plates removed, permitting full observations of the meter's operation under normal conditions. Meter will be driven

Name and Address — Booth

by a small motor. Also showing 5-A and 5-B meters in which there have been many recent improvements. Note perfect division of the valves on all port openings.

Helme & McIlhenny, Philadelphia, Pa..... 66
Consumer and station meters.

Hoffman Specialty Co., Waterbury, Conn..... 34

Homestead Heater Co., Newark, N. J..... 71
Radiant heaters.

Humphrey Co. Div., Ruud Mfg. Co., Kalamazoo, Mich. 32
Featuring the Humphrey multi-coil storage system for large volume water heating, and the Kalamazoo automatic storage heater for broad household selling. Other items on display.

Improved Equipment Co., The, New York, N. Y..... 30
Will show working model, one-quarter size, of a hand operated retort pushing machine designed for manually operated through retorts. Also photos and colored plates of several complete gas plants recently installed, showing layouts of the Improved Horizontal gas ovens.

Isbell-Porter Co., Newark, N. J..... 53
Woodall-Duckham continuous vertical retorts.

Johns Manville Corp., New York, N. Y..... 50
Insulation, packing and cements.

Koppers Construction Co., The, Pittsburgh, Pa..... 18
By-product coke and gas plants.

Lambert Meter Co., Brooklyn, N. Y..... 62
Featuring new steel stamped gas meter as well as regular line of gas meters, gas apparatus, etc.

Lattimer-Stevens Co., The, Columbus, O..... 8
Exhibiting our line of meter connections, shelves, stopcocks, valves and seals.

The Linde Air Products Co., New York, N. Y..... 55
Exhibiting welded steel and cast-iron pipe, together with engineering data and design information in connection with bronze welded cast-iron pipe and welded joints for steel pipe.

Lyon Metallic Mfg. Co., Aurora, Ill..... 5

McDonald & Co., D., Albany, N. Y..... 67
Consumers dry meters, station meters, apparatus, meter provers, calorimeters, gauges.

Maryland Meter Works, Baltimore, Md..... 65
Gas meters, recording complaint meter, demand load indicator.

Metric Matal Works, Erie, Pa..... 63
Exhibiting new 500 lt. B Ironcase Meter using Glover slide type valves and bellows type of diaphragm. This meter, built to stand overloads, will handle a maximum working pressure of 50 lbs. per square inch and weighs 825 lb. Capacity at ½ inch differential 4,800 c. f. h. and at 2 inch differential, 9,500 c. f. h.

Mueller Co., Decatur, Ill..... 1
Pipe fittings.

National Tube Co., Pittsburgh, Pa..... 29
Pipe.

New Process Stove Co. Div. of American Stove Co., Cleveland, O..... 48
Featuring new type six-hole gas range, with two ovens, one large, enamel linings, exterior enameled, two Lorain oven heat regulators—the Red Wheel kind. Popular price.

The Parsons Co., Newton, Iowa..... 12
Trenchers.

The Peninsular Stove Co., Detroit, Mich..... 81
Gas ranges.

Pittsburgh-Equitable Motor Co., Pittsburgh, Pa.
Pittsburgh Division..... 41
Equitable Division..... 42
Showing gas meters, oil and gasoline meters, regulators, flow controllers, recording gauges and meter provers.

Pittsburgh Water Heater Co., Pittsburgh, Pa..... 33
Automatic and tank water heaters.

Quick Meal Stove Co. Div., St. Louis, Mo..... 46
The display will include a new range with flush, boltless front, concealed manifold, a new type of top burner and a barbecue style broiler (white porcelain enameled with gray trimmings). Lorain oven heat regulator will be shown on all ranges.

Reliable Stove Co. Div. of American Stove Co., Cleveland, O..... 44
Featuring the new Reliable range with concealed manifold and many other important features.

Renzor Mfg. Co., Mercer, Pa..... 20
Gas heaters and gas fired house heating furnaces.

Riter-Conley, Pittsburgh, Pa..... 24
Gas holders.

Robbins Publishing Co., New York, N. Y..... 2

Roberts Brass Mfg. Co., The, Detroit, Mich..... 79
Gas cocks, valves and fittings.

Roberts & Mander Stove Co., Philadelphia, Pa..... 43
Showing 1928 models Quality gas ranges, embodying all the latest features in modern approved gas range construction.

Robertshaw Thermostat Co., Youngwood, Pa..... 3
Robertshaw Thermostats for all types of gas-fired industrial and domestic appliances. Featuring the Robertshaw AutomatiCook. Exhibiting large photographic displays of heater thermostats and names of ranges using AutomatiCook. Special display illustrating the new AutomatiCook Book.

Roper Corp., Geo. D., Rockford, Ill..... 54
Gas ranges with complete oven control.

Ruud Mfg. Co., Pittsburgh, Pa..... 37
Several new models.

Semet-Solvay Engineering Corp., New York, N. Y..... 59
Water gas equipment.

Slattery & Bro., Inc., J. B., Brooklyn, N. Y..... 73
Gas ranges and gas fired steam radiators.

Stacey Mfg. Co., The, Cincinnati, O..... 22
Exhibiting photos of various types and sizes of gas holders, purifiers and gas plant equipment installed during the past year. Featuring horizontal and vertical types of gas tanks for high pressure storage.

Standard Gas Equipment Corp.:
Acorn Div., Aurora, Ill..... 74
Oriole Div., Baltimore, Md..... 75
Triplex Div., New York, N. Y..... 76
Vulcan Div., New York, N. Y..... 77
Ranges, water heaters and space heaters.

Superior Meter Co., Brooklyn, N. Y..... 17
Featuring slow speed meters. Operating at slowest B speed while delivering fullest A capacity. All sizes up to 150 light.

Tappan Stove Co., The, Mansfield, O..... 16
Featuring the new Tappan IN-SO-TOP gas range. Oven walls insulated. Ventilated. Cooking top of solid oil annealed cast iron over star burners in combustion chamber of cast iron. Designed for unusual flame efficiency.

Titeflex Metal Hose Co., Newark, N. J..... 15
Titeflex all-metal hose for domestic and industrial field. A. G. A. Laboratory approved. Rubber slip end standard pipe fitting ends.

U. S. Cast Iron Pipe & Foundry Co., Burlington, N. J. 25
Featuring deLavaud centrifugally cast iron pipe for high pressure gas. Also various joints, including bronze welded, Dresser type and Anthony joints.

Wailes Dove-Hermiston Corp., New York, N. Y..... 21
Bitumastic enamel.

Walker & Pratt Mfg. Co., Boston, Mass..... 27
Gas ranges.

Western Gas Construction Co., The, Fort Wayne, Ind.. 19
Featuring our Western automatic measuring oil meter, which will be displayed. For water gas machines. Dial graduated in gallons from zero to eighty. Predetermined amount of oil can be delivered to water gas set by setting meter. Hand close for emergency.

West Gas Improvement Co., Inc., New York, N. Y.... 83
Featuring Glover-West vertical retort plants. An illuminated panel will show the construction and heating arrangements of a Glover-West continuously operated retort. In addition there will be displayed pan-

Name and Address Booth

els of colored photos depicting various U. S. A. and Canadian plants. The Stamford plant will be featured by way of drawings, charts and data of test results.

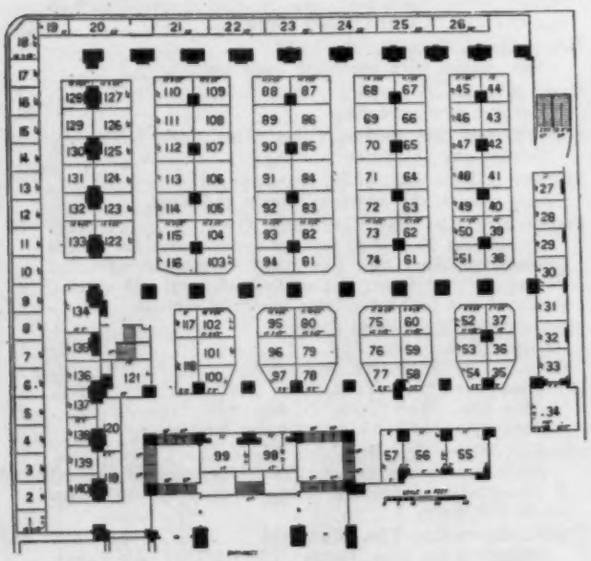
Wood & Co., R. D., Philadelphia, Pa..... 36
Sand spun cast iron pipe, fittings, heavy castings, valves.

BASEMENT

AKme Flue, Inc., Baltimore, Md..... 78
AKme Flue for gas ranges of all types.

Alpha-Lux Co., Inc., The, New York, N. Y..... 45
Exhibiting "Lux-Material" gas purifying oxide, "Lux-Sponge," Lux Specific Gravity Recorder, Dr. Ott-Lux-Gas-Tester, Dr. Strache-Kling-Calorimeter and "Luxit" refractory concrete.

American Cast Iron Pipe Co., Birmingham, Ala..... 99
Exhibit featuring Mono-cast Cnetrifugal pipe and pipe jointing materials. Motion picture entitled "Peevish Pete's Pipe Dream" showing how Acipo Mono-cast centrifugal pipe is made. This picture is different from the usual run of pictures of this kind.



Booth Plan—Basement

American Gas Association Laboratory, Cleveland, Ohio 5

American Gas Furnace Co., Elizabeth, N. J..... 115
Booth will be used for reception purposes. Photos of every kind of carburizing machine and furnace, heating machines, oven furnaces, forges, cyanide furnaces, soft metal furnaces, automatic heat controllers, etc., will be shown.

American Gas Products Corp., New York, N. Y..... 56

American Heater Corp., St. Louis, Mo..... 124
Gas water heaters.

Armstrong Cork & Insulation Co., Pittsburgh, Pa..... 28
Exhibit of corkboard for insulation of walls and roofs of residences and roofs of commercial and industrial buildings. Armstrong's and Nonpareil insulating brick for insulating furnaces, ovens, boiler settings, etc. Nonpareil high pressure covering and blocks for high temperature lines, ovens, etc. Armstrong's cork covering for low temperature lines.

Bailey Meter Co., Cleveland, Ohio..... 83
Featuring accurate, reliable and economical power and gas plant metering equipment for measurement of steam, water, air, gas, oil and other fluids.

Barber Greene Company, Aurora, Ill..... 116
Digging, loading and conveying equipment.

Barstow Stove Company, Providence, R. I..... 17
Stoves.

Bartlett-Hayward Co., The, Baltimore, Md..... 95
Our engineers will be in attendance and will have new catalogs ready for distribution.

Beckwith Company, The, Dowagiac, Mich..... 30
Featuring patented 4-way oven construction, by which heat is admitted into the oven from six sides, giving rapid and complete distribution, with food evenly browned. Round Oak coral ivory porcelain enameled range. Round Oak stovetop range with closed top, operated by three burners. Top has several unique features.

Bernitz Furnace Appliance Co., Boston, Mass..... 104
Exhibiting Bernitz Carborundum clinker-proof ventilated blocks for water gas generators. Let us explain how they will save by way of increased life and capacities.

B-Line Boiler Co., Cleveland, Ohio..... 13
House heating boilers.

Bryant Heater & Mfg. Co., Cleveland, Ohio..... 81
Gas fired house heating furnaces.

Chambers Mfg. Co., Shelbyville, Ind..... 71
Fireless gas range.

Chapman Valve Mfg. Co., The, Indian Orchard, Mass.. 100
Valves.

Chicago Bridge & Iron Works, Chicago, Ill..... 106

Chicago Tubing & Braiding Co., Chicago, Ill..... 117

Cleveland Co-Operative Stove Co., The, Cleveland, O.. 94

Cleveland Gas Burner & Appliance Co., The, Cleveland, O. 11
Barber patented jet gas burners.

Cleveland Trencher Co., Cleveland, O..... 134
Trenchers.

Clow & Sons, James B., Chicago, Ill..... 122
Featuring Clow Vented Gasteam Radiator. Portions of exhibit have been cut away to show details of construction. Down-draft diverter cast as an unattachable part of radiator, takes up no extra space and eliminates possibility of radiator being installed without it. Non-extinguishable flame by drafts.

Columbus Heatng & Ventilating Co., The, Columbus, O. 9
Columbus house heating gas furnaces.

Combustion Utilities Corp., New York, N. Y..... 33

Combustion Engineering Corporation, New York, N. Y. 92
Featuring fuel saving equipment, manufactured by its subsidiaries: Combustion Engineering Corporation, Dry Quenching Equipment Corporation, Coal Carbonization Corporation.

Connersville Blower Co., The, Connersville, Ind..... 133
Showing Connersville Rotary Displacement Meter in a new size; also industrial gas pumps in a new design.

Co-Operative Foundry Co., Rochester, N. Y..... 16

Cooper Oven Thermometer Co., The, Pequabuck, Conn. 67
All types of oven thermometers for domestic oven purposes.

Cutler-Hammer Mfg. Co., The, Milwaukee, Wis..... 53
Showing the new small sized Thomas Meter for measuring gas quantity and a medium sized Thomas calorimeter for measuring gas quality. Also new Cutler-Hammer total heat controller and total heat meter. These will all be operating. Dean valve control unit operating a standard 24-inch gate valve will be shown.

Detroit-Michigan Stove Co.:
Garland Division, Detroit, Mich..... 55
Jewel Division Detroit, Mich..... 102
Gas ranges.

Detroit Vapor Stove Co., Detroit, Mich..... 51
Gas ranges.

Drake Non-Clinkering Furnace Block Co., New York.. 105

Dun-Rite Clock Device Co., New York, N. Y..... 54

Eclipse Fuel Engineering Co., Rockford, Ill..... 26

Economy Governor Co., Anderson, Ind..... 41
Featuring a new service governor which eliminates the blowing of mercury seals on this equipment. This is the "No-Blo" governor.

Name and Address	Booth
Hurley Machine Company, Division of Electric Household Utilities Corp., Chicago, Ill. Featuring Thor electrically operated and gas heated washing machines and ironing machines. Thor Folding Ironer has ironing width of 34 inches and takes up no more space than kitchen chair. Thor Automatic Ironers suitable for large homes and institutions. Thor Cylinder Washer designed for large users and equipped with gas heater.	85
Electrolux Servel Corp., New York, N. Y. Gas fired refrigerators.	125
Estate Stove Co., The, Hamilton, O. Gas ranges.	31
Fuller-Warren Co., The, Milwaukee, Wis.	86
Gas Refrigeration Corp., New York, N. Y. Sorco refrigeration with gas.	123
General Brass Co., Detroit, Mich.	63
Giant Manufacturing Co., Council Bluffs, Ia.	19
Globe Stove & Range Co., The, Kokomo, Ind. Showing advanced styles, quality gas ranges at attractive prices.	75
Groble Gas Regulator Co., Anderson, Ind. First time showing of new district station regulator that automatically increases and decreases the outlet pressure according to demand. Regulator is flexible and when set to meet requirements never has to be changed. Also showing our complete line of regulators and governors.	93
Hays Manufacturing Co., Erie, Pa. Valves.	10
Hoffman Heater Co., The, Louisville, Ky. Water heaters.	74
Home Incinerator Co., Milwaukee, Wis. Be sure to see the "X-Rayed" Home Incinerator. Innermost secrets of its operation disclosed. Also showing complete layout of up-to-the-minute new merchandising campaign material.	97
Hones, Inc., Charles A., Baldwin, N. Y.	3
Honeywell Heating Specialties Co., Wabash, Ind. Showing our two methods of automatic room temperature control: First, room thermostat actuating motor connected by chain to any type of spring or snap acting fuel line valve; second, thermostat actuating electric gas valve mounted in fuel line. The latter safe against current failure.	7
Imperial Brass Mfg. Co., The, Chicago, Ill.	39
Johnson Gas Appliance Co., Cedar Rapids, Iowa.	14
Kemp Mfg. Co., The C. M., Baltimore, Md. Kemp System for industrial heating operations.	20
Kitson Company, Philadelphia, Pa. Displaying full line of brass and iron body gas cocks and exhibiting new hexagon and brass fittings.	139
Klimatic Clothes Dryer Corp., New York, N. Y.	89
Kompak Co., The, New Brunswick, N. J. Showing all copper storage systems, adapted for every hot water purpose, supplying one faucet up to the needs of a twenty-story office building. Also showing the original automatic pilot and safety fuse plug.	101
Lamneck Co., The W. E., Columbus, O. Featuring Lamneck Dryer designed especially for domestic use, having thermostatic heat control. Scorching or overheating prevented. Indirect heat and natural circulation of air.	128
Lavino & Co., E. J., Philadelphia, Pa. Featuring Lavino oxide, gas purifying material and Kromepatch high-strength refractory cement, which bonds without fluxing.	38
Lawson Manufacturing Co., Pittsburgh, Pa. Water heaters.	12
Leeds & Northrup Co., Philadelphia, Pa.	36
Link-Belt Company, Chhicago, Ill. Ash handling equipment.	103
Logan County Coal Corp., Cincinnati, O. Featuring Logan-Chilton coals for coal and water gas manufacture. Note firm structure of coal samples and results from 100% use in water gas generators.	96
Lovekin Water Heater Co., Philadelphia, Pa. Lovekin automatic gas water heater.	82

Name and Address	Booth
Lunkenheimer Co., Cincinnati, O.	108
McWane Cast Iron Pipe Co., Birmingham, Ala. Featuring screw-joint cast iron pipe in small diameters for high-pressure gas. Combines permanence of cast iron with the small sizes of wrought pipe. Threaded connection without couplings.	120
Magee Sales Company, Boston, Mass.	8
Magno Products, New York, N. Y.	35
Majestic Mfg. Co., St. Louis, Mo. See our "Superservis" hotel gas ranges. Air-tight ovens; full insulation; gas economy.	23
Malleable Iron Range Co., Beaver Dam, Wis. Featuring Paramount ranges with Paramount superheated pure air oven in the new enamel finish. Oven is insulated and controlled by automatic regulating device. No waste heat, no overheating.	60
Maxon Premix Burner Co., The, Muncie, Ind. Gas burners.	37
Mears-Kane-Ofeldt, Inc., Philadelphia, Pa. Showing sectional models of Kane fire tube and Ofeldt water tube boilers for industrial use and Kane cast-iron sectional gas boilers for steam, vapor or hot water house heating. A feature will be the first showing of type 42 low water gas cut-off for use with Kane fire tube gas boilers.	87
Merco Nordstrom Valve Co., New York, N. Y. Showing a complete drip pot installation operating under high pressure air, typical in every respect as laid in distribution work. New types of curb and meter cocks, and a new design of 12-inch valve, with cut-open models.	73
Mid-West Incinerator Corp., Chicago, Ill.	53
Milwaukee Gas Specialty Co., Milwaukee, Wis. Lighters, gas cocks, heat regulators. All appliances for the gas range.	64
Mine Safety Appliance Co., Pittsburgh, Pa.	29
Minneapolis Heat Regulator Co., Minneapolis, Minn. See exhibit of latest developments in safety controls and complete line of automatic regulation for gas-fired house heating plants.	110
Moore Brothers Co., Joliet, Ill.	22
Mueller Furnace Co., L. J., Milwaukee, Wis.	121
Mulcare Engineering Co., New York, N. Y.	40
National Lead Co., New York, N. Y.	27
National Refrigerating Co., New Haven, Conn. Featuring the new improved Ice-O-Lator gas refrigeration equipment for small boxes, ice cream cabinets and drinking fountains.	127
Ohio Foundry & Mfg. Co., The, Steubenville, O.	25
Patrol Valve Co., The, Cleveland, O. Featuring thermostatic safety control valves that automatically turn on and shut off the main gas supply with every operating cycle of the system.	6
Peerless Water Co., Boyertown, Pa. Will exhibit one Peerless 5 section 5-inch steam boiler completely equipped with metal insulated jacket, automatic safety low water cut-off, thermostatic safety pilot and all other accessories and control equipment. Also one 4-section Peerless 3-inch water boiler completely equipped. Data and illustrations on design and construction will be provided.	32
Permuttit Company, The, New York, N. Y.	50
Public Service Production Co., Newark, N. J. Engineers and constructors.	111
Public Service Stock & Bond Co., Newark, N. J.	112
Reynolds Gas Regulator Co., Anderson, Ind. Featuring our new Model 10 series of individual high pressure house regulators to handle inlet pressure up to 100 pounds and deliver outlet pressure for domestic consumption. Also showing adjustable valve in our single district station regulators with new high and low pressure auxiliary governors, permitting our station regulators to be easily serviced in the line.	15
Richmond Radiator Co., New York, N. Y.	18
Robins Conveying Belt Co., New York, N. Y. Robins machinery for preparing handling and storing coal and coke.	80

Name and Address — Booth

Roots Company, The P. H. & F. M., Connersville, Ind.. 88
Exhibit arranged to show history of our connection with the gas industry. Our recent developments will be shown by a small high presure meter and a small ndustrial blower; also small blower and small booster of type extensively used in industrial service. Data and information on our Rotary Positive Displacement blowers, gas pumps, meters, vacuum pumps and liquid handling pumps.

Safety Gas Main Stopper Co., Brooklyn, N. Y..... 77
Street department necessities.

Sands Manufacturing Co., Cleveland, O..... 98
Automatic gas water heaters.

Scientific Heater Co., The, Cleveland, O..... 116
Garage heaters.

Sexton Stove & Mfg. Co., S. B., Baltimore, Md..... 62
Gas ranges.

Smith Mfg. Co., The A. P., East Orange, N. J..... 90

Superior Sheet Steel Co., The, Canton, O..... 65
Featuring Super-Metal Oven Lining Sheet Metal.

Spencer Thermostat Company, Cambridge, Mass..... 119
Showing several interesting applications of the Million Dollar Thermostat to gas appliances. A worthwhile novelty demonstrating this invention will be distributed.

Sprague Meter Co., Bridgeport, Conn..... 2
Featuring a model of our 6-inch flange meter and low pressure regulators. Sectional views of Standard and Dreadnaught types of meters will be shown; also complete line of regulators and curb top meter with top interchangeable with that on our standard type meter.

Stacey Bros. Gas Constr. Co., Inc., The, Cincinnati, O.. 61
Builders of gas holders of any size; also purifiers and other gas plant equipment. Showing construction of very large gas holders by means of special bull rivets of our own design; making it possible to drive large rivets cold.

Standard Calorimeter Co., The, East Moline, Ill..... 40
Showing the Parr Recording Gas Calorimeter, notable for its accuracy, reliability and minimum amount of attention required in its operation. Also the Illinois Gas Apparatus, designed for the rapid and accurate analysis of city and industrial gases of all types.

Standard Gas Equipment Corp., New York, N. Y..... 24
Gas ranges.

Sturtevant Co., B. F., Boston, Mass..... 79
Exhibiting the two-bearing Turboblower for furnishing blast to water gas sets, also for use as gas exhausters and gas boosters. Also calling attention to the multistage centrifugal gas boosters for higher pressures, which will be exhibited.

Sullivan Machinery Co., Chicago, Ill..... 69

Superior Manufacturing Co., The, Carnegie, Pa..... 107

Surface Combustion Co., The, New York, N. Y..... 34
Furnace engineers and manufacturers.

Sweet & Doyle Foundry & Machine Co., Troy, N. Y.. 21

Time-O-Stat Corp., The, Milwaukee, Wis..... 57
Valves, pilots and controls for gas appliances.

Tinnerman Stove & Range Co., Cleveland, O..... 75
Gas ranges.

Tyler Company, The W. S., Cleveland, O..... 113

U. G. I. Contracting Co., The, Chicago and Philadelphia 91
Showing in action the new U. G. I. Intermittent Chamber Oven, which is attracting widespread attention. This oven has the good features of the U. G. I. vertical retorts, but permits carbonization in bulk. Economical and efficient in operation, it can be installed in small as well as large plants.

Universal Smokeless Boiler Co., Ravenna, Ohio..... 4
Industrial boilers.

United States Bureau of Mines, Washington, D. C..... 137

Utilities Publication Co., Chicago, Ill..... 53

Victaulic Company of America, New York, N. Y..... 126
Pipe joints.

Name and Address — Booth

Welsbach Company, Gloucester, N. J..... 68
Displaying the self-action water heater and an "all star" cast of room heaters, featuring the million dollar burner. Popular "matinee" prices.

West Bend Aluminum Company, West Bend, Wis..... 44
Featuring the Waterless Cookers and Aluminum Whole Meal cooking sets. Renew interest in home cooking and furthers use of gas for cooking.

Wilcolater Company, The, Newark, N. J..... 109
We will show the strikingly neat dial which is now to be supplied in white porcelain instead of black material as heretofore used. The white dial adds greatly to the appearance of the Wilcolator as well as to the stove so equipped. Other improvements in design for greater efficiency which have been made will be explained by booth attendants.

Wilder Metal Company, Niles, Chio..... 42
Linings.

Youngstown Pressed Steel Co., The, Warren, O..... 84
Pressed steel.

Wood Conversion Company, Chicago, Ill..... 72
Balsam-Wool heat insulation for new and old homes will be exhibited. Material, made of felted wood fibers placed between sheets of asphalt coated paper, comes in a flexible state. Easy to apply and highly efficient. Ideal for gas heated homes.

THIRD FLOOR

OFFICE EQUIPMENT MANUFACTURERS

Addressograph Company, Chicago, Ill.
Office equipment.

Burroughs Adding Machine Co., Detroit, Mich.
Adding machines.

Ditto, Incorporated, Chicago, Ill.
Manufacturers of Ditto Duplicating Machine, which copies the consumer's bill, one or more stubs and all office records from one writing. Eliminates rewriting and copying errors.

Felt & Tarrant Mfg. Co., Chicago, Ill.
The Comptometer provides speed with accuracy on all adding, multiplying, dividing and subtracting in gas plant accounting. It facilitates proper organization and routing of work of the plant.

General Office Equipment Corp., New York, N. Y.

Jamestown Metal Desk Co., Jamestown, N. Y.

Proudfit Loose Leaf Co., The, Grand Rapids, Mich.
Featuring the "Proudfit" meter indexing binder. A full line of Proudfit ledger, journal and catalog binders will be displayed.

Rand Kardex Service Div., New York, N. Y.

Remington Rand, Inc., Tonowanda, N. Y.
Two books on gas company office methods will be distributed. Modern office equipment, especially adapted to the most up-to-date systems in use in gas companies, will be on display.

Remington Typewriter Co., New York, N. Y.

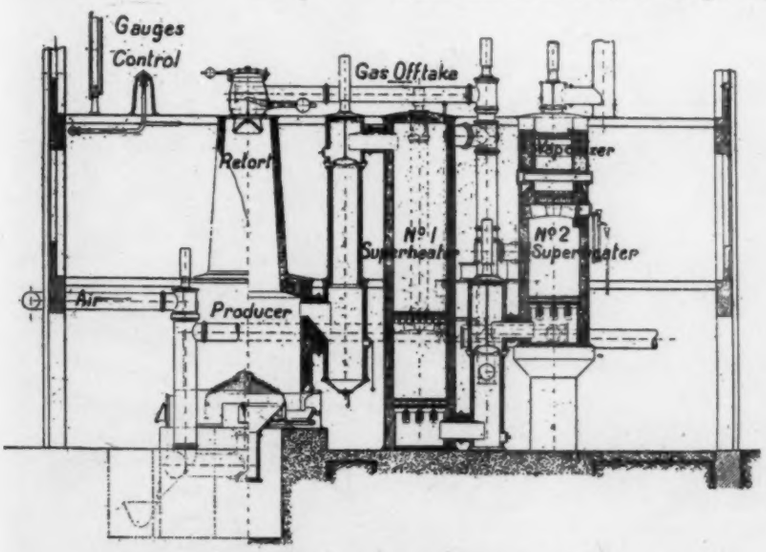
Underwood Typewriter Co., New York, N. Y.

PROGRESS IN GAS TECHNOLOGY
Domestic and Foreign

Freisa Complete Gasification Plant

The distinguishing feature of this plant is that it yields a gas which is enriched by the cracking of tar. This is accomplished not by injecting liquid tar into the incandescent fuel bed, but by passing the gas, as it is made, through a superheater which cracks and fixes the tar fog coming over from the retort.

The installation, shown in the accompanying illustration, is designed for an hourly output of 35,000 cubic feet of 405 B.t.u. gas. The checker-brick superheater No. 1 is for cracking the tar and the second superheater is for heating the steam used in the water gas reaction. This heat is taken from the blow gases



THE "KREISA" COMPLETE GASIFICATION PLANT.

A vaporizer is placed above the superheater in which apparatus the water is converted into steam; this also being accomplished by means of the heat in the blow gases. A vaporizer is placed above the superheater, in which apparatus the water is converted into steam, this also being accomplished by means of the heat in the blow gases. The end of the make run is indicated by a fact that water is not converted into steam in the vaporizer, this water collecting and causing an electric signal to operate, whereas the operator turns over to the blow run.

All the valves are worked hydraulically from a central control, and the valves which come into contact with hot gases are water-cooled. The producer has a rotary grate and an air blast of 35.4 inches of water is blown through it. Part of the air is diverted to the superheaters for the combustion of the blow gases, and the remainder passes up through the coke bed and thence to the first superheater, which is brought up to a temperature of approximately 750 degrees C. Then they are led through the second superheater, where further combustion takes place, and finally through the vaporizer and stack valve.

The steam produced in the vaporizer reaches a temperature of 400 degrees C. in the second superheater and passes thence through the grate into the bottom of the producer. The water gas that is formed in the producer goes up through the retort, distilling the coal by means of the sensible heat that it contains. The mixture of water gas and coal gas then passes through the outlet and enters the first superheater. The B.t.u. in the gas at this point are only 348 to 360, but it carries a good proportion of tar fog in suspension. The function of the superheater is to crack this tar and raise the thermal value of the gas.

From the superheater the gas passes to a hydraulic main through a valve which is kept closed during the blow periods, then through a condenser and a relief holder, and is mixed with the main stream of coal gas before the exhausters. The coal gas produced in the retort during the blow is led through a branch in the offtake pipe into a secondary hydraulic, which condenses the primary tar.

The original article was published in the form of an address read before the French Gas Congress. It is also published in abstracted form in Gas Journal, 1927, pages 222-3.

Sulphur In Gas Coke

The fixation of the sulphur in coal in the coke produced from it is explained in different ways. It is claimed for example that the sulphurated products in the coal are of pure organic origin and are due to the decomposition of vegetable albumens. Then again it is said that the presence of sulphur is due to the impregnation of the coal with water containing iron sulphate.

If the total content of sulphur in coal and in coke is compared, it is found that in spite of the removal of sulphur as hydrogen sulphide during distillation, the two are sensibly the same. There is no fixed ratio between the two sulphur contents. Two identical coals, coked under similar conditions, will give different percentages of sulphur in the cokes produced from them.

Numerous analyses were made of coals and cokes to try to clear up this problem. It was found that the practically determined total sulphur content of the sulphide in coke is greater than the theoretically calculated amount. This is explained by the fact that a portion of the organic sulphur and pyritic sulphur in coal is fixed in the state of sulphide of iron, the iron being present in the coal, or in the state of oxide or of non-sulphurized compounds in the coal.

The results of numerous experiments led to the conclusion that the oxidation of sulphides in coke was a maximum at 500 degrees C and at that temperature the sulphur set free remains fixed, that is "adsorbed" on the surface of the coke. This seems improbable.

The desulphurizing action of carbon dioxide on the sulphur in coal was also studied and three samples of the same coke were quenched in water free of air and carbon dioxide, in ordinary water and in carbonated water. The results showed that the quality of carbon dioxide formed during the quenching of the coke by water is largely sufficient to assure the maximum decomposition of

the sulphides and that the addition of water containing carbon dioxide is unnecessary. Journal des Usines a Gaz, 1927, 275-6.

SOME HIGH LIGHTS FROM P. C. G. A. CONVENTION

(Continued from page 54)

deal with, the major part of the research during the past year has been to dry and dispose of the product instead of concentrating on increased production. Therefore, in order to place this product on a solid paying basis, it was necessary to complete an energetic program of research dealing with the preparation of the sulphur for the market and its most efficient utilization on farm products after being sold.

The disposal of our gray sulphur paste finally resulted in an extensive experimental program, whereby various drying methods could be tried out to determine the cheapest and easiest way of obtaining a profit through the sale of sulphur. As found last year, the merit of our material lies in its fitness, which makes it very valuable as dusting sulphur. However, the market for sulphur as a dust is not so well developed as that for lime sulphur spray. For this reason, the first type of drying attempted was to produce a sulphur which could be used for the spray type of insecticide.

The sulphur recovery work of the past two years has established two very important factors: (1) That the recovery of sulphur is well understood and a steady production can now be counted upon in commercial quantities. (2) This sulphur is assured a ready sale, as most of the excellent qualities are well known and, besides, it is the only sulphur produced in California. Inasmuch as the trend of sulphur prices is upward, liquid purification and sulphur recovery should continue in importance.

Condensing and Scrubbing

Among the subjects considered by S. C. Schwarz and his associates of this committee during the past year were separation of lamp black from gas, condensing and scrubbing for tar removal, oil washing of gas, naphthalene removal, cyanogen content control, and effect of washing gas on its chemical composition and heating value. An extended and unusually valuable report was presented by the committee of which only the following summary can be presented:

A. Although still in the experimental stage, electrical precipitation of dry lampblack from fuel oil gas at a temperature of 700° F. or over, looms as the most practical and efficient contender to the present wash-box method.

B. Electrical precipitation of tar at a temperature above the dew point of water after lampblack has been separated by the above means, appears as the most satisfactory advance to be made in the separation of primary tar practically devoid of free carbon and water from fuel-oil gas. Due to the high naphthalene content of the treated gas, further separation of condensible hydrocarbons can probably be best attained in a washercooler or oil-washer.

C. Naphthalene can be removed well below its dew point at the lowest main temperature by an almost negligible oil consumption in properly designed and operated scrubbing equipment of the modern and improved types. Other light oil hydrocarbons, including the organic sulphur compounds, can be completely removed from manufactured gas by washing with oil at a rate more or less dependent on Raoult's law in an apparatus capable of functioning efficiently at the predetermined oil rate.

D. The complete removal of HCN from raw fuel-oil gas by intensive water washing is quite possible at water rates well within reason, but further study of the actual loss of combustible matter by solution in the water and the possibility of recirculating the water after aeration, should be made to more definitely establish the relation between the advantages and disadvantages of this method.

Dust and Moisture Control

K. C. Tomlinson was chairman of the committee investigating the effect of moisture and dust in gas on internal corrosion of the mains and surfaces and other detrimental effects due to deposits The long and complete report of the committee is summarized in the following four brief conclusions:

The committee in studying internal corrosion as a problem and dehydration as a mitigative measure in controlling it have emphasized the following points:

1. The nature of deposits encountered in mains and services indicates that internal corrosion is accountable for a large proportion, roughly about 70 per cent.

2. Internal corrosion is an electrochemical reaction dependent upon the presence of water vapor.

3. Dehydration will eliminate internal corrosion but should be justified by economic comparison of cost involved and benefits derived.

4. In any case, the control of dust and other foreign material in the distribution system will be a problem at least for a considerable period of time and devices should be installed to eliminate these deposits and safeguard service.

American Gas Catalog Corrections

In compiling the department, "Classified Index to Advertised Products," in the 1927 edition of the American Gas Catalog, the name of Helme & McIlhenny should have appeared under the following headings: Calorimeters, Calorimeter Accessories, Connections, Meters; Diaphragms, All Size Meters; Diaphragms, Oil; Gauges, Gas; Gauges, Mercury; Meter Swivels and Caps; Meters, Air; Meters, Gas; Meters, Gas Recording; Meters, Natural Gas; Meters, Positive Displacement; Meters, Prepayment; Meters, Provers; Meters, Station.

Also the name of E. J. Lavino & Co. should have appeared under the headings Purifying Materials and Sponge.

We are glad to make these corrections in the American Gas Journal.

Gas and Fuel Division Officers of American Chemical Society Selected

For the coming year the following officers will serve the Gas and Fuel Division of the Society:

Chairman, A. C. Fieldner.

Vice-Chairman, S. P. Burke.

Secretary-Treasurer, O. O. Mallies.

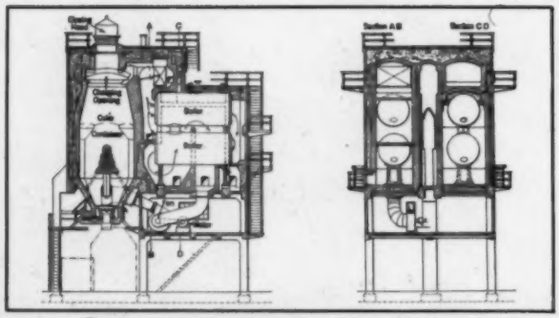
Members of Executive Committee: G G. Brown, R. S. McBride.

The meetings of the society during 1928 will be held at St. Louis in April, and Swampscott, Mass., in September.

B.t.U.s Heat Your Home
GAS HEATING PLANT
The little B.T.U.s will heat your whole house without your attention. The pipeline is your fuel supply and the gas holder your fuel bin. Automatic control by wall thermostat assures you of perfect heating.
Gas heat is clean, of standard quality and available for instant use. Your phone call or letter will bring detailed information immediately from our House-heating Fuel Experts.
Industrial Division
Telephone: TRIangle 7500
The Brooklyn Union Gas Company
Build That House Heating Load

DRY
QUENCHING

Introducing
(Sulzer System)
Dry Quenching
of Coke



Sulzer Dry Quenching Plant

What is Dry Quenching?

Dry Quenching Reclaims Waste Heat

THE SULZER SYSTEM for dry quenching coke is as great an improvement over wet quenching as is the modern by-product coke plant over its predecessor, the bee-hive oven.

The Sulzer System recovers the sensible heat of the hot coke and utilizes it in making steam. The ten installations now in operation show averages of from 700 to 900 lbs. of high-pressure steam generated per ton of coke cooled —and dry quenched coke is of better quality, contains less breeze and is producing better thermal efficiency in both blast furnace and gas house practice. Incidental advantages include the saving of water, the elimination of corrosion due to acid vapors, and the absence of freezing in cold weather.

The Sulzer System is simple and dependable. The hot coke is charged into a sealed quenching chamber. Inert gases are circulated in a closed cycle by means of a fan, first through the hot coke mass where they absorb the sensible heat of the glowing coke, and thence through a steam boiler where the hot gases transfer this heat to the water in the boiler circulation and convert it into steam.

The introduction of the Sulzer System by the Dry Quenching Equipment Corporation is in accord with the established policy of International Combustion Engineering Corporation to offer, through its subsidiaries, improved methods for eliminating fuel waste and for the generation of steam under more economical conditions.

THE above 32-page booklet, now in course of preparation, not only describes and illustrates the Sulzer System, but is a valuable treatise on the subject of coke quenching. It is replete with data and interesting information on the results secured in existing dry quenching plants.

A copy will be sent upon request.

Dry Quenching Equipment Corporation

INTERNATIONAL COMBUSTION BUILDING

200 MADISON AVE. NEW YORK — N.Y.

A Subsidiary of International Combustion Engineering Corporation

Visit Booth 92 at American Gas Convention

Hot Water and Gas Heated Water Made Synonymous

Influencing the customers' thoughts by association of ideas

By Ray Martin

Display Manager, Consolidated Gas Company of New York

NATIONAL advertisers do recommend the use of hot water. The car cards in the above display attest the truthfulness of this statement. "But," continues this window display advertisement, "the importance of using hot water is no greater than the convenience of having automatic hot water service at any hour of the day or night."

It is conceded that the association of ideas assists in recalling some name or event. For some unknown reason it seems easier for us to remember Mr. Dowd's name if we note, mentally, that it is a four-letter word beginning with D. Or John's prompt acceptance of a nine o'clock bedtime has always indicated the approach of a birthday.

In using the above window display advertisement as an example are we too hopeful when we believe that people—later observing "Ammo" or "FAB" advertisements—will associate these products with gas heated water? This writer believes it is possible to make "hot water" and "gas heated water" synonymous in the minds of the public. Calling attention to the recommendations of some of our national advertisers is but one way.

GAS MERCHANDISING

Domestic — Home Service

A Story in a Strip

By Wm. H. Matlack

Look, you, this picture tells a true story!

A salesman who was in the habit of using his brains became rather peeved at a certain gas man he called on, the latter stating in no uncertain terms that "the gas appliance business was 'on the bum.'" The persistency of the gas man's allegation irritated the salesman and he finally planned a way to wake up the pessimistic fellow.

One day the salesman visited a mid-western city and the sales manager of the local gas company told him how he was bringing folks into the merchandising department to buy small items and later selling them major appliances.

"The thing is so obvious," said the sales manager, "that I cannot see why all the gas companies don't employ it. As you know, the big department stores offer what they call 'leaders.' These are really bait-bargains—offered to bring people into the store to the end that they will view the other merchandise.

"The merchandise manager long ago reasoned, 'if I can get them in here to buy these bargains I can sell them other merchandise while they are in the buying mood.' And it works," concluded the sales manager.

The salesman told the pessimistic gas man of the scheme, which was tried in his particular case, and it worked.

Work out a kitchen convenience table, run a small ad: Gas Toasters, Special Tuesday, only 19c.—then rub up these stoves, heaters, water heaters and the balance of your stock, and when folks come in to buy toasters take their money and sell 'em a new range, a radiant heater, a water heater or a laundry stove—remember they are in a buying mood and that is the time to sell them.

I WAS GIVEN AN IDEA
I PUT IT TO WORK
IT STOPPED FOLKS
WHO MADE PURCHASES
THIS MADE MORE NET
WE ARE ALL OUT OF SMALL SIZE POLISH
—and then he started to expose more and more merchandise to SALES

Selling Gas for Water Heating

By Mr. A. L. Kebbe

Sales Manager, The Connecticut Power Company

IN MAPPING out any campaign it is customary first to make a survey. We, of course, believe that a survey is necessary, but we want to put across the idea that unless the surveyors are followed by diggers there will be very little dust flying.

Why should we waste time making an elaborate survey with records that are expensive to maintain? Why not put our time, money, and energy into actual selling? We would, however, suggest a prospect list which may be obtained by going down the street and taking the license numbers of automobiles so that the owners' names may be secured from a registration book. Surely anyone who owns an automobile can afford a water heater. Then, too, the salesman can visit the assessor's office and secure a list of people who own their homes, although we do not feel that a person should refuse to install an automatic heater simply because he does not own the house he lives in. There is very little more work to installing a water heater than to installing a gas range, and any person who lives for any length of time in one place can afford to pay for the connections of a water heater.

Sell Tank Heaters As Well As Automatics

Governmental statistics show that incomes in the United States are divided into two classes—$2,000 and less, 92 per cent; over $2,000, 8 per cent. With these figures staring us in the face we must realize that the potential market for water heaters is not confined to automatics but that the tank heater has a very definite place also. Our plans must therefore be applicable to the humble tank heater as well as to the majestic automatic. Our own

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* Abstract of a paper presented at the New England Regional Sales Conference, New London, June 3-4, 1927.

experience in New London has been that we sell practically two tank heaters for every automatic. However, with the price of automatics coming down to where we can sell a reasonably good storage system with tank and heater complete for less than $100, as against $75 for a copper tank and $18 for a tank heater, we feel sure that the automatic heater business will increase materially, particularly in the case of new houses. As to the type of automatic, whether storage or instantaneous, we feel that this should be decided by the local companies, according to their own conditions. The next step in the campaign is the method to be employed in selling.

We have used the word "campaign" again. Let us explain now what we mean by it. It is generally considered an intensive drive for a limited period on some appliance which is being sold at some special price or terms, with possibly a premium also. This, however, is not our idea of a campaign. When we say "campaign" we mean that we should map out a plan of progressive selling to give us the desired result in the shortest length of time, and stick to it month after month until we obtain that result.

Co-operative Selling Necessary

Of course, there are numerous different methods of selling water heaters. Ask the store manager how to do it and he will say that you should have a good display on the sales floor so that customers coming in will see them. The window dresser will claim that it is his proposition to attract people as they go by. The newspaper man will advocate intensive newspaper advertising. The printer swears that broadside mailings are just the thing. The salesman knows that it must be done through his efforts and he will tell you that he alone can put heaters over. These people are all right as far as they go. On the other hand, the plumber, if you ask him, will tell you that the gas company has no right to sell water heaters, that it is strictly a plumbing proposition and that he should have the business. Everybody feels that he is the fellow to do the job, yet none can hope to succeed without the help of the other. We believe that each one has a definite place in the selling of water heaters and therefore it follows that what we should develop is co-operative selling.

It seems to us that some method should be devised whereby we can gather into one common body everyone who in any way is interested in the sale of gas water heaters. It is easy to get the manufacturer and the gas company together, but there is another factor entering into this business which is not so easy to interest, to wit: The Plumbing Trade.

As we said before, the plumbers think it their job to sell water heaters, and as a rule they are apt to feel rather disgruntled if anybody else obtains what they think belongs to them. However, we question very much if the gas water heating does belong entirely to them, or entirely to the gas company for that matter. We feel that for the best results the plumbers and the gas company should work hand in hand.

We have tried both ways in New London. In 1925 we sold water heaters alone on the "bang-bang" plan, trying to buck up against the great tide of plumbers coming the other way, and we sold 38 heaters. In 1926 we adopted the following plan, which we are still using:

1. We sell to customers at retail only.
2. We sell at wholesale to the plumbing trade only. Any discounts given to builders or contractors through quantity purchase will be given through the plumber on the job.
3. We protect the plumber on listed leads for thirty days. After that time the sale goes to anybody who closes it.
4. We sell automatic heaters to plumbers at 20 per cent discount from the list price f.o.b. our warehouse, with 5 per cent additional for cash in thirty days.
5. If the plumber desires to turn the lead over to us to sell and install the heater, we pay him a commission of 15 per cent on the sale.
6. We invite plumbers to participate in water heater sales.
7. We work with the plumber selling automatic water heaters, particularly in the case of new houses.
8. We finance sales made by plumbers, if the customer's credit is approved by our credit department.
9. In New London we require the plumber to sign a conditional bill of sale on every water heater he buys because experience has taught us that he may collect his money from his customer and then go bankrupt, leaving us to hold the bag. With a bill of sale, however, we are protected.

Salesmen Back Plan

This plan is backed up by a salesman of our own whom we have trained in selling water heaters. We pay him a salary large enough for him to live on plus a bonus for every heater sale. This has proven particularly advantageous to the water heater business because heretofore when he worked on a commission basis he was continually wrangling with the plumbers regarding leads, etc. Now he is working much more harmoniously with them.

You may think that the water heater salesman has nothing much to do, but that is far from being the case, as he is now busier than ever before. It is his duty to follow up the building permits issued in our city and to learn who the architect, owner, and plumber of the proposed building are. He then calls on the architect and tries to persuade him to specify gas equipment. If he can not do this, working with the plumber he calls on the owner and endeavors to sell the idea of gas equipment, particularly water heaters, to replace any coal appliances that may be specified. This plan has brought in a tremendous amount of business that we would never have obtained otherwise. We, of course, sell the plumbers at a fairly large discount so that our margin is comparatively small, but our salesman picks up enough business himself to pay his salary so that we at least break even.

Selling During Dull Periods

By Special Correspondent

When there is a cry of tight times and retailers in general are indulging in "forced to vacate, horrible sacrifice" and other types of gyp sales, it is then that the merchandising manager who is on his toes may cash in. There can be no doubt that these so-called sales bring out buyers, but as the American housewife is a pretty shrewd buyer, she will pass these sales by, and go to the stores where real merchandise is offered for sale at fair prices. Watch for an influx of these sales, then get your newspaper and display window advertising to working—and watch 'em buy. The time to sell folks is when they are in a buying mood. When a customer comes into your store and buys a gas range, makes a down payment, don't say, "Thank you!" until you have first told him of the advantage of real hotel hot water service in his home and have led him up to a self-action water heater. When he has signed up for this service it's time to say, "Thank you!"

Gas Companies Should Study Block Rates

The inference is, therefore, that while it may not be necessary for the gas industry to develop rates which reflect cost of service as fully as those that have been developed in the electric industry, it is well for the gas industry to consider seriously the further use of the block rate. Rates cannot be divorced from sales and the introduction of block rates is an essential part of selling.

A conspicuous example of the value to gas companies of the increasing use of block rates with consequent inducement to greater profitable use of gas can be taken from the statistics compiled last year for the manufacturing gas industry. Such rates played no small part in making it possible for the total manufactured gas sales in 1926 to show an increase of 9.23 per cent over those in 1925. As compared with this increase, a large city served with natural gas at practically flat rates showed an increase of but 4.11 per cent in volume of sales. And yet the average cost per B.t.u. in the natural gas city was probably one-third of the average cost of a manufactured gas B.t.u.

Such figures put a more or less definite valuation upon matters of price and rates as factors in the selling of gas for domestic purposes.

In addition to price, service is as important, if not more important, in selling. In domestic business it is paramount whether the gas company is selling merely a certain volume of gas at a price, and this sale is terminated when delivery of the gas has been made at some convenient point, or whether the company is selling the accomplishment of whatever the customer wishes to do.

For years the gas industry, as a whole, operated on the first of these bases. It felt that its duty had been performed when gas was made available to the public. It gave more or less indefinite assurance of continuity of service. It paid little attention to the means whereby gas was to be transferred from the service line to the point at which it would be consumed.

Electricity Gave Desired Impetus

Coincident with the erection of the first central steam station for the generation of electricity, gas sales started to increase and since that time the increase has been uninterrupted. The introduction of the competitive element, electricity, which was destined to practically strip the gas industry of its entire lighting load, instead of ruining the business, proved to be the incentive that was necessary to develop it more rapidly. With this growth it has become necessary for gas companies to pay more and more attention to the conditions surrounding the actual use of gas by the customer. As service has improved, satisfaction has increased; sales have been greater. And, as with a snowball rolling down hill, the curve showing the use of gas moves steadily upward until we come to conditions as they are found today.

How far a gas company can go in the matter of service depends largely upon conditions, but it is doubtless accurate to state that there is no gas company in the United States which could not afford to profitably go farther than it is going today. This is true regardless of the fact that increased interest in the customers' needs would mean an immediate out-of-pocket cost which, at the time, might appear as an unsurmountable obstacle to more improved service.

How far a gas company can go is a problem to be solved in each individual instance, but it has been found profitable to go to very great lengths. But whatever the extent of the service rendered, the fact of its existence takes the problem of selling from the exclusive jurisdiction of the sales department and places a share of the responsibility upon every employee of the gas company.

At the risk of boresome repetition, it must be clearly set forth that the wellman, the carburetted water gas operator, the distribution foreman, the pressure man, the meter reader and all of the rest of the employees must interest themselves to such an extent in their particular responsibilities that the sales department will be able to sell a gas of uniformly satisfactory characteristics, delivered under reasonably uniform pressure conditions, and at a price which will result in an economical accomplishment of the desired piece of work by the customer but which will, at the same time, give to the company a fair return upon the property devoted to the public service.

Basic Selling Ideas Can Be Applied

And so there comes a consideration of specific details of selling gas. Having established a price which will offer inducements for increased use, both by domestic and other customers, and having established a satisfactory continuity of supply under uniform conditions, the problem becomes one of selling. There is apparent no good reason why, in the gas industry, all of the selling aids that have been found

desirable and useful in other industries should not be brought into play.

First, the advantages of gas must be known by every employee of the gas company and must be unceasingly brought to the attention of the public This is accomplished in two ways—by advertising and by demonstration. Endless effort must be expended in letting the public know the advantages of gas as a fuel. What are some of them?

Gas is convenient. It is clean. It can be easily controlled. It is instantly available. It requires no storage, no preparation, no labor in handling, no removal of refuse and no specially skilled operators It can be burned without smoke or objectionable odors. It is paid for after use.

To be specific, gas in the laundry can heat the water, boil the clothes, keep the water in the washer warm, dry the clothes and supply the heat for ironing them. The majority of operations can be automatically controlled. The laundry is clean and a pleasant place in which to work and the total work is minimized. No other fuel is so useful while making possible such great economies.

The Blue Star Plan

A second selling point probably can be brought best to mind by quoting the following extract from a booklet of the American Gas Association:

"Our big competition today in the domestic market is not solely with competing fuels, such as oil, coal and electricity. Equally important are the other products designed to increase the comfort of the home, with which we must always compete for our rightful portion of the housewife's time and attention, and for our share of the dollar she is spending. This variety of competition can be met only by shaping our sales program in a concerted manner, surrounding our product with new styles, fads and habits of a more interesting nature to women, and through a systematic sales follow-up, maintaining that interest at all times.

"The Blue Star Plan meets the necessity for presenting our product in a newer and more interesting and attractive aspect today, by establishing an entirely new standard of gas service for greater home comfort and convenience locally and by trademarking and featuring that trademark thereafter locally and nationally.

"The primary purpose is to sell more gas by providing for the installation of more and better appliances in the home, and by creating and retaining in the minds of the home makers a greater appreciation of the importance of domestic gas service as an aid to their comfort and convenience.

"The feature of the plan regarding the use of high grade appliances constitutes to some extent the fulfillment of a public responsibility. It arises from the desire to create a demand for domestic appliances constructed in accordance with standard specifications of the industry, to safeguard the public health, and to guarantee efficient and satisfactory service to the customer, and thus fulfill our obligation to the American public. But the commercial results of trademarking and thus encouraging the sale of better appliances are no less important to the industry than its significance from the standpoint of safety. Just as a poor appliance is a handicap to greater sales of gas and an invitation to our competitor, so a quality appliance, rendering satisfactory service day in and day out, is the industry's better salesman for promoting the use of gas in the home."

Consideration of Appliances

The third outstanding factor in this matter of selling is the appliance in which the gas is to be burned. In the past equipment has not been all that it should be. This lack is not altogether a charge that can be made against the manufacturer. The gas company had not developed its product to the point where it was sufficiently profitable for the manufacturer to develop the high-grade appliances that are found available today. It is generally true that the manufacturers have co-operated with the industry and have advanced their products as rapidly as the gas industry has proved itself capable of selling such better product.

Natural gas companies particularly have been handicapped by the wasteful appliances used by their customers. Government publications have shown the immense amount of gas wasted by low-set cooking range burners, short coil water heaters and burners placed in appliances which were designed for the use of solid fuels.

Most gas companies have made progress in informing the public regarding more modern appliance design, proper burner adjustment and correct usage. Recommendations have not been uniform because they have been based on local laboratory tests, published data from various sources or merely ideas of the particular individuals coming in contact with the public.

Now, however, a definite and forceful help, a national institution with a national viewpoint, has stepped in to help. The American Gas Association Testing Laboratory is at work testing various kinds of gas appliances. Approval requirements for ranges, tubing, space heaters, water heaters, gas furnaces and gas boilers have already been drawn up and lists of many approved appliances bearing the Blue Star of approval have been published. Tests are made with different gases under varying conditions, so that the approval of the laboratory is national in scope.

The effect of the laboratory must be to improve the safety, economy and general satisfaction of gas appliances. The gradual elimination of poor appliances must raise the level of gas utilization. The appreciation of gas by the general public due to greater satisfaction in its use and the wider use of gas must result.

Who Will Sell Appliances?

Fourth, it must be determined whether gas appliances are to be sold by the industry or whether the sale of appliances shall be left entirely to outside agencies. Opinion varies greatly on this sub-

ject. Apparently statistics are available to prove that both schemes have been successful.

Generally, however, best results seem to have accompanied the sale of merchandise by the utility that has had a true understanding of the real purpose of selling of the merchandise. Where the utility has been unfailing in its realization that gas appliances are sold by it merely as a means of developing larger and more satisfactory gas load and that the primary object of the merchandising has not been the accumulation of a profit from the merchandise itself, it has been found that relations between utility and dealers have been extremely satisfactory and have all profited.

If the utility is to merchandise, however, it should do so along lines that represent best practices and sound business. Prices should be maintained, not cut. The grade of the merchandise should certainly be the best obtainable from the points of view of efficiency, safety and maximum value per dollar. All merchandising helps should be employed, such as advertising, demonstration, introductory sales, attractive window displays, and the like, but none of these means should be employed except with the thought that they are fair means and those which are likewise within the reach of the high-grade, responsible dealer or department store.

Some utilities have developed the merchandising situation to a point which has resulted in definite co-operative relations with the dealer. Often, even special inducements made by the utility are offered simultaneously by the dealers.

The electrical industry has improved its situation by the development of the Electric League, an institution found in practically every large city. It might be that the gas industry can increase the results obtainable by merchandising if it institutes some similar co-operative scheme.

Gas Companies Justified in Selling Appliances

Yet, through it all, the selling of appliances by gas companies appears to be justified only if the utility bears in mind continuously the reasons why it is in the merchandising business, namely:

1. To increase the volume of gas sales.
2. To improve the load factor.
3. To put at the disposal of the customer safer, more efficient and generally more satisfactory means of using gas.
4. To create a public demand for such better equipment, so that dealers may share in the benefits resulting from such demand.
5. To improve relationships with the public by the establishing of better contacts resulting from sale by the company and use by the customer of satisfactory equipment.

The fifth and final means of selling that can be considered in this paper is the one that deals with the use of the equipment by the customer after he has provided himself with that which is properly designed. Generally, this service is now known as "Home Service," although a broader interpretation seems preferable.

Many are inclined to think of home service as a series of cooking demonstrations. It should have a far broader meaning. Cooking demonstrations are usually nothing more than means of attracting and holding the attention of the public.

Benefits of Home Service

Home service, or its equivalent, insures, first, a satisfactory installation. The importance of the installation cannot be overestimated. The best range or furnace or water heater cannot function or give satisfaction if it is improperly installed. It should be the responsibility of the sales department, if not of the home service branch of that department, to make sure that installations are satisfactory.

Sometimes this involves even the housepiping. Often this problem is met through the use of special employees who have contact with architects and builders and are charged with the responsibility of seeing that such architects and builders understand the requirements of building with regard to adequate piping.

With the equipment installed properly, it is necessary to insure the best use of this equipment and to encourage increased use. This does not necessarily require special and individual calls. In some instances, it is desirable to follow up the installation of new equipment such as automatically controlled ranges. This assures that the purchaser understands the meaning and use of the heat control. Much good can be done, however, through contacts with special groups, by means of lecture work and special demonstrations.

But it all boils down to permitting the accomplishment of that which the customer wants. It is the job of every employee of the company. It requires competitive rate structures. It calls for everyone on his toes all the time. It means SELLING.

PRESERVING AND CANNING IN HOME MADE EASIER AND FASTER BY USING PECTIN

"In order to have jams and jellies of the best quality it is still necessary to subject the fruits and vegetables to long and slow boiling," says the New Jersey Public Information Committee. "However, in jelly-making, the process may be shortened considerably by the use of commercial pectin. Time, fuel and effort will be saved, while the flavor of the finished product will not be altered.

"Pectin in certain definite proportion and strength is needed if the jelly is to 'set.' Since the ripening of fruits lowers the native pectin content, the tendency has been to use fruit not too ripe, and then to boil away the juice in order to concentrate the pectin.

"With commercial pectin, riper fruit may be used, which is usually less expensive. Less sugar is also needed, and there is no need for intensive boiling away of the juices. In addition, with the commercial product it is possible to make jelly from many fruits which it has been impossible to utilize up to now."

stet . . (of all things) . . by w. h. Emm

"The Old-Time Southern Cook Is Passing. Let Her Pass!" So says E. D. Brewer, of Atlanta. Ed covers Dixie with his eyes open and he says, "the old order passeth." Listen to him:

"In the days of my grandmother the large kitchen was separate from 'the big house' and connected thereto by a wooden platform or porch about four feet wide. When I crossed this isthmus in the old days and entered the kitchen I found it hot as the sands of Sahara, but entirely comfortable to the old negro cook.

"'Aunt Maria,' I said, 'don't you find it mighty hot in here?'

"Aunt Maria had on a broad grin. All of her ivories were on dress parade.

"'Lordy, honey chile, I likes ter feel de heat!'

"Her fat black arms, sleek with sweat, looked like glistening black marble. She was making a cake, the recipe calling for 32 eggs, whites beaten stiff.

"The big kettle sang merrily on the big kitchen stove.

"Aunt Maria has gone now. Maybe she is in nigger heaven, where heat pleases the population forever and aye.

"With her passing came the efficient housewife, cook, clubwoman, movie-goer and whist enthusiast.

"There is something gone with Aunt Maria from our Southern cooking, and it is the overheated kitchen, with its drudgery and its waste.

"The meals prepared today are just as savory and good as in the old days.

"The insulated oven of the heat-controlled gas range and the insulated tank of the automatic storage system are holding errant B.t.u.'s at bay and giving the modern housekeper not only a cool, inviting kitchen, but allowing her to remain out of it most of the time.

"The gas-fired refrigerator has eliminated the tracks of the ice man, and the gas-fired incinerator has made us indifferent as to whether the trash man comes or not.

"The oldtime Southern cook is passing. Let her pass!"

—•—

More models, a new one every year and fewer numbers, that is the cry the range manufacturer hears every day. You'll find that gas ranges will follow automobiles; there will be a brand new model each year," said one gas man. "We will not be shocked to see 'em come out in pastel colors," said another.

Old Sol frowns, he cannot spoil foods when they are stored in a gas refrigerator—and it takes the Laclede Gas Light Company to put this story over in a window display. Here is a display that created a great deal of favorable comment and caused hundreds of St. Louisians to go into the Laclede's main and branch stores to learn more about the flame that freezes. Old Sol in relief and radiating from yellow satin full upon the gas refrigerator, reached out for the sweltering St. Louisian, and it is said the Laclede did a real job on gas refrigerators in this, their first, year. J. J. Burns is an advocate of window advertising, and during a recent electric refrigeration show held in St. Louis devoted eight windows in the main store to gas refrigeration displays.

"Hot dog!" Hotzone has some regular thumb-nail advertisements for use by the gas man-at-large; they're terse, timely, telling; and there's a reason why in all of them, that folks should provide their homes with hotel hot water service —in short, these latest water heater advertisements are in tune with the times. Look't 'em!

The Club Plan of demonstration has reached the gas industry. In East St. Louis, Ill., the Home Service Department of the Illinois Power and Light Corporation is using it successfully. It works like this: A member of the home service department secures the permission of some home manager who has just purchased oven heat regulated range to cook a whole meal for the customer, suggesting, "If you would care to have as your guests a few of your friends, I will be very happy to prepare, cook and serve the meal and also provide all the food without cost to you. All that I ask is that you invite friends who you think would be interested in learning about the oven heat regulated range and how easy it is to operate."

When arrangements are completed **and it is understood that no** attempt will be made to sell during the demonstration, the home manager is then asked to say to her guests after the demonstration that if they will furnish the demonstrator with their names and addresses she or a salesman from the gas company will be glad to call and show by photograph the various types of ranges that may be had with heat regulator, quote prices, etc., etc.

So far all women approached have been agreeable to the arrangement and at all demonstrations held to date every woman present has furnished her name and address and expressed a desire to learn more about oven heat regulated ranges, prices and terms. All prospects developed in this manner are turned over to regular district salesmen.

—•—

"Wanted, old stoves," is an eye arrester, and a good streamer head to employ in a trade in on your old range sale. It is now being employed by a number of gas companies over the country, and so far as we have been able to learn, its use has caused a lot of folks to purchase gas ranges of modern design. We understand that this sale produced orders for eighty ranges in three weeks at Freeport, Ill.; eighty-eight in one week at Chattanooga, Tenn.; one hundred and fifty in two weeks at Rockford (home of Roper), in Illinois, and that the Georgia Power Company, Atlanta, sold four hundred and sixty-one ranges in two weeks' time. It can be done, if your advertising is not economized to death.

INDUSTRIAL GAS

IF IT'S DONE WITH HEAT — YOU CAN DO IT BETTER WITH GAS

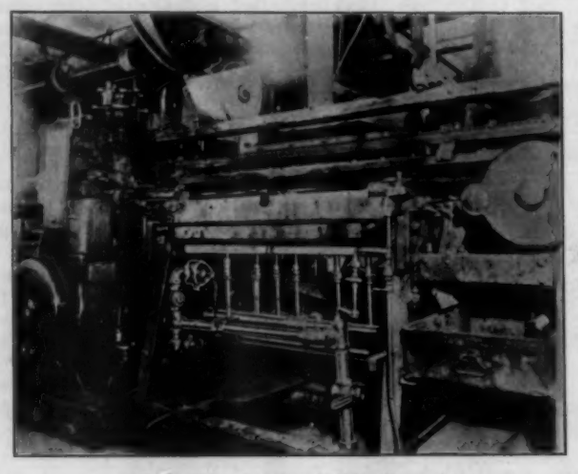
Temperature Control in Industrial Furnaces

Ismar Ginsberg

THE industrial gas man is often asked, Why industrial gas? What reason is there for his coming into a plant that has been running for many years along well-defined lines, using methods that have become ingrained from habit and precedence and trying to lift this plant out of the rut and change the methods, as he claims, for better ones? Is it simply to sell industrial gas and increase the revenue of his company? If that is the sole or principal reason, he will find that his business is built upon a sandy foundation that will shift without the least warning and leave him minus this and other like business.

Industrial Business Built on Firmer Foundation

But we all know, of course, that the industrial gas business of this country is built on much firmer foundations. The industrial gas business is here to stay and to increase. For the gas industry has sold industrial gas not so much to increase its total gas sales but to serve industry and help it overcome certain of its difficulties. The industrial gas engineer. selling gas to a plant, sells as well thermal knowl edge of a high order, and in doing so he entrenches himself firmly in the good graces of the manufacturer who is interested not so much in the use of



Can Side Seamer With Control

gas as a fuel as in saving himself from difficulty and inefficiency in his heating problems.

Our thesis therefore is that the industrial gas engineer sells thermal knowledge and incidentally gas, and in selling thermal knowledge he naturally must sell thermal control. He cannot hope to obtain the necessary results unless he can tell just what is going on in his furnace at any moment of its operation and also unless he can control its operation, particularly from the standpoint of the temperatures developed in the furnace. Thus he must use thermometers, pyrometers and regulating instruments.

Control on Lacquer Oven

A close study will reveal that gas cannot be used successfully as an industrial fuel unless the apparatus 'n which it is burnt is properly controlled. It must be realized in the first place that gas is the superior fuel. It is, as a rule, the costlier fuel. It is the premier fuel par excellence, for considerable work has been done on the raw gas making materials before the gas that flows out of the furnace burner is rendered available for industrial purposes. Hence it must be used with great care; it must not be wasted.

There is unquestionably an optimum temperature for every industrial heating operation. It may be an easy matter to attain this temperature in the furnace no matter what kind of fuel is used. But the maintenance of this temperature continuously is quite another matter. And it is in this connection that the fuel, whether coal, coke, gas or the like, is of paramount importance. The ease of regulating the temperature within the furnace depends largely on the flexibility of the fuel, meaning the ease with which its combustion is controlled. A coal or coke fire cannot be regulated as closely or as conveniently as a gas fire, where the mere shutting of a valve stops the combustion completely while its opening immediately starts the heating operation.

Thus gas must be used with control, with accurate knowledge of the conditions that exist in the furnace if only for the reason that it is an expensive fuel

You'll sell more Gas Ranges if you sell one or more of these six famous makes

QUICK MEAL
DANGLER
DIRECT ACTION
CLARK JEWEL
NEW PROCESS
RELIABLE

Equipped with the famous

LORAIN

It's *More Profitable* for You to Sell Red Wheel Gas Ranges

A PROBLEM today with most merchants is to get more people to come to their place of business. Probably the quickest and the easiest way to do this is to slash the selling price of your merchandise to a point where there is no longer any profit in it for you.

The next method in order of importance, and the better way, is to sell merchandise that can be classified as famous in one respect or another.

The six brands of gas ranges equipped with the famous Red Wheel Lorain Oven Heat Regulator, and which are manufactured by American Stove Company, are undoubtedly the most famous products in their line.

The several brand names were well established and stood for quality merchandise when the oldest of us were still in school. For many, many years these trade names grew in importance in the public mind through sheer merit of the products themselves and through the reputation of American Stove Company for square dealing.

Then, nearly nine years ago, on top of this solid foundation, American Stove Company began to build a huge structure of public good-will through national advertising.

This structure of national advertising built around and about the Lorain Oven Heat Regulator had revolutionized the design and construction of gas ranges, has made the business more profitable and of far wider scope, and has been the greatest factor in the public's present day acceptance of gas as the ideal fuel for home cooking.

Today the six makes of ranges manufactured by American Stove Company and the famous Red Wheel Regulator with which they are equipped are known the world over. Scarcely a woman lives who intends to buy a gas range that cannot be sold a Red Wheel Gas Range in less time and with less effort than any other make.

This is true because the millions of dollars that have been spent on advertising Red Wheel Gas Ranges have, without question, performed the most difficult part of the task of selling, namely, making the product immediately acceptable to the public.

There may be very good reasons why you believe it to be more profitable for your clerks and yourself to spend your good time convincing a woman that some unknown brand of gas range is as good as a Red Wheel Gas Range.

But, we believe that you will find it more profitable and that your trade will be better satisfied if, upon their first inquiry for a new gas range, you lead them directly to one equipped with the Red Wheel, without the slightest necessity for excuses, reasons or vague explanations for handling them to the exclusion of all other makes. At least, try this plan for a time and judge for yourself.

AMERICAN STOVE COMPANY

801 Chouteau Ave. :: **St. Louis, Mo.**

World's Largest Manufacturers of Gas Ranges

THESE FAMOUS GAS RANGES ARE EQUIPPED WITH LORAIN:

DIRECT ACTION	NEW PROCESS	CLARK JEWEL
DANGLER	QUICK MEAL	RELIABLE

10-11-12-27

and that economy in its use can be obtained only in this wav. But it is also true that gas, because it is the quality fuel, is used for many quality operations, where expensive products are being treated. This refers particularly to the heat treatment or metals. And its being used in such processes infers again that control must be exercised in order to be sure that the desired results are obtained without injury to the products under treatment. It must not, however, be thought that the applications of industrial gas are limited only to quality operations and neither must it be inferred that it is only in such operations that accurate knowledge and ability to control temperature conditions within the furnace are always necessary, but in the quality operations this need is accentuated.

Two Problems

We are thus confronted with two problems. First we must know what the temperature conditions are in the industrial furnace, and second we must have means for maintaining these conditions at the optimum point. Since gas heating operations are mostly conducted at fairly high and at times very high temperatures, it is common to use a pyrometer for indicating or recording the temperature within the apparatus. The difference between the indicating instrument and the recording type is just as apparent as the difference between an oral statement and a written one. The indicating pyrometer will, to be sure, show the temperature at any moment, but when that moment is passed, there is no longer any visible evidence of what that temperature was. The recording type of instrument continuously and permanently writes down this temperature on a suitable chart so that at any time in the future it may be easily ascertained what the temperature was in the furnace at any particular moment.

Indicating instruments have, of course, their use, but where the temperature is of great importance, as in heat treating, wire patenting, japanning and enameling ovens and the like, it is far more satisfactory to have a recording instrument to record the temperature for future reference, particularly in case the product has not turned out as expected and some fault in the operation is suspected.

Selection and Location of Instruments

It is necessary to exercise careful judgment in selecting the instrument and also in locating it at the proper point in the apparatus. This is of great importance in large furnaces or ovens, as, for example, in heat treatment furnaces provided with mechanical conveying devices, where the products are treated as they are moved through a long tunnel-like apparatus. It is also true of most any furnace, for there will always be one point that is best selected for installing the thermocouple of the pyrometer. If this is not done, then in spite of the high quality of the fuel used, the perfect design of the heating apparatus and the accuracy of the instrument, the results will not be good. There is no rule which may be given in this connection which could be followed in all cases, except to carefully study the heating process that goes on in the furnace and then to place the instrument at such a point therein that it will record or indicate the same temperature as that of the material being treated.

Temperature Control

Our second point made above is that there should be means available for controlling the temperature conditions within the industrial gas-fired furnace. There is, of course, a gas valve which can be opened or shut or throttled, and this can be done in one

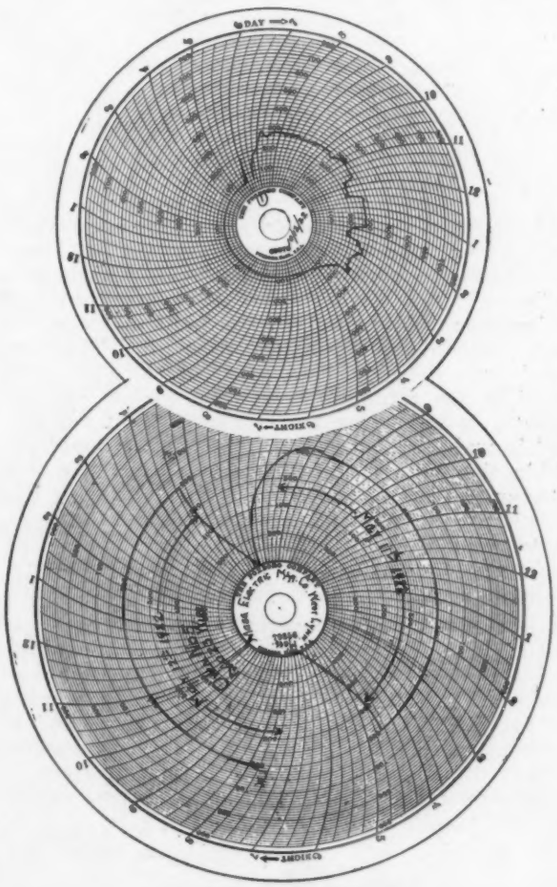


Fig. 1 (*above*) *Hand Control*
Fig. 2 (*below*) *Automatic Control*

of two days. Either an operator may be taught to manipulate this valve so that the recording instrument will show constant temperature conditions throughout the operation, or else the valve can be controlled by means of an automatic device which either snaps it shut or opens it wide or gradually throttles or opens it, as the case may be.

If an operator operates the gas valve it is understandable that he must be ready at all times to manipulate it. He must be ever-watchful and remain with his eyes literally glued on the dial recorder or the stem indicator, and miss no fluctuation in the temperature so as to compensate it by either opening or closing the gas valve. It is patent that even

if it were possible to secure such a man, the work would be so laborious that he would be sure to fail at some time. Furthermore, such operations as heat treating of steel and other metals are so delicate and so dependent on the absolute maintenance of an optimum temperature whose permissible fluctuation is only a few degrees that it is impossible to secure good results with hand control. There is too much reliance required on the perseverance of the operator, on his ability to properly manipulate the gas valve to maintain a constant temperature during the operation.

Furthermore, hand control means that an operator must be constantly on the job at the furnace, and it is doubtful that one operator can control more than one furnace in most cases and more than two at the maximum. The labor cost is thus an item which must be taken into consideration.

Accuracy of Control Important

However, the main difficulty is in the accuracy of the control. If a record is taken on the hand controlled furnace temperatures, as shown, for example, in figure 1, the irregularity of the temperature will be immediately evident. In this particular case the hand controlled-furnace was used in decorating metal-ware, the dipped or sprayed metal part being baked in the furnace. It is easy to see that the operator, while trying to do his best, did not succeed in maintaining constant temperature conditions within the furnace, and this was particularly true between two and three o'clock in the afternoon. The large depressions in the line from time to time indicate periods when the oven was being charged or discharged, the opening of the door immediately resulting in a considerable decrease in the temperature.

For the sake of comparison, another chart is shown, see figure 2, which recorded the temperatures during the operation of a wire enameling furnace. This chart is really remarkable for the accuracy of the temperature control. The temperature line is absolutely perfect and shows what can be secured in the way of automatic control with an instrument of proper construction. It is hopeless to expect to obtain such results with hand control.

Less Gas Consumption

The closer the temperature is maintained to the optimum point by means of automatic control, and it has been clearly demonstrated that close regulation can be secured in this way only, the less gas will be consumed in the process. Thus, if the best operating temperature is indicated as 500 degrees F., it is of course of no advantage, and it may be of decided disadvantage, to run the furnace part of the time at 550 or 600. But aside from the injury that might be done to the material under treatment, there is the important matter of increased gas consumption, that is, gas that is used in raising the temperature above the required point and absolutely wasted as far as the effect on the product is concerned.

The installation of a thermal regulator on a gas-fired furnace which has been operated without it heretofore always results in a saving in fuel. A few actual items will be cited to show just how large this saving can be. Thus a regulator installed on a metal pot in the printing shop of a New England newspaper resulted in a saving of thirty per cent on a month's gas bill. Another newspaper reported a saving of at least ten per cent on gas used in linotype and intertype machines. It often happens that the saving on gas soon pays back the cost of the regulator. Still another publisher advises a saving of twenty-five per cent on the gas bill in operating the metal pot. In reporting the results of using a thermostat another newspaper publisher calls attention to the fact that prevention of the variation in temperature made it possible to obtain a standard metal which did not contain bits of brass and the like which would be melted into it when the temperature was not controlled.

Similar savings in fuel have been obtained on thermostatically controlled gas fired furnaces in many other industries. Thus a test was made on lead melting pots in a battery casting room. The consumption of gas without thermostatic control was 212 cubic feet per hour, while that with control was 180 cubic feet per hour. The total amount of gas saved on the one machine was 770 cubic feet per day.

Saving the Material Heated

It must not be thought that the saving is limited to gas only, for when heating solder pots on soldering machine and various other products which can be lost by volatilization if the temperature is too high, considerable savings have been effected in material melted, and in fact the money value of such savings is at times considerably greater than that involved in the gas saving. There is also connected thereto the advantage of being certain that the heating operation is carried out under the best temperature conditions and hence there is neither danger that the temperature will be too low and the product not properly treated, nor too high and the product spoiled.

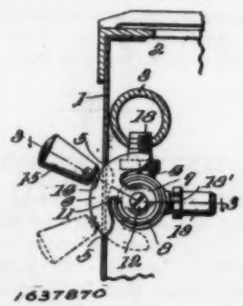
Then there is the advantage that the thermostatically controlled furnace will operate more uniformly than one which is not controlled. The properties of the finished product, no matter what it might be, will be more uniform. Furthermore, the operation is standardized and the production of the furnace is increased. Increased production in thermostatically controlled furnaces has been the experience of all sorts of manufacturers who have installed these controls. Thus a large can company reports that the production of the department in which the controllers were installed was increased fifty per cent, not mentioning the saving in solder which was lost, due to high temperatures in the non-regulated furnaces.

Temperature control may be applied practically wherever gas is employed as an industrial fuel and where operating at an optimum temperature is necessary in order to secure best results. Temperature control is, of course, of special importance in the heat treating industries because of the great changes that are effected in the metal when the temperature is not right. It can, however, be used in many other heating operations.

Patents of Interest to the Gas Industry

Closed Gas Stove and Gas Valve

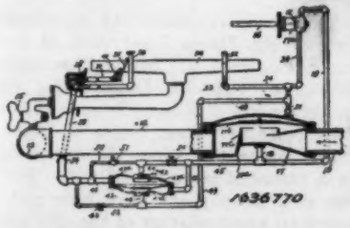
U. S. Patent No. 1,637,870, F. G. Nicolaus, Cleveland, O., assigned, American Stove Co., St. Louis, Mo. Filed January 19, 1927, is concerned with a closed gas range structure provided with a valve. The wall of the closed structure is shown at 1. The manifold which is parallel and adjacent to the closed structure is shown at 3, and con-



nected to that manifold is the gas valve 7. This valve communicates with the burner through the opening 19. The front wall of the closure has an elongated opening, shown in dotted lines in the figure, through which the handle by which the valve is turned extends. In this way it is possible to retain the closed structure of the stove and at the same time have easy control of the gas burner by means of a handle which is easy to reach and operate.

Thermostatic Pilot Control for Gas Burners

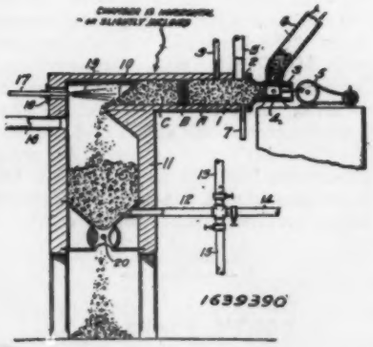
United States Patent No. 1,636,770, shown in the accompanying illustration, is concerned with a thermostatic pilot



control for gas burners which shuts off the flow of gas to the main burner when the pilot flame is extinguished. The main burner is shown at 14 in the figure and the pilot light is seen at 26. The latter is connected by the pipe 33 with the thermostat 38 and also with the valve 43. When the thermostat is cooled by reason of the extinguishing of the pilot flame, then the valve 43 is opened and the opening of this valve has the effect of preventing the opening of the main control valve which is on the pipe 12 feeding gas to the burner. Thus the escape of gas from the burner is prevented. Otto Fox, Cleveland, O., and W. E. Stark, East Cleveland, O., assignors, The Bryant Heater and Manufacturing Co., Cleveland, O. Filed April 14, 1926.

Carbonizing Fuel

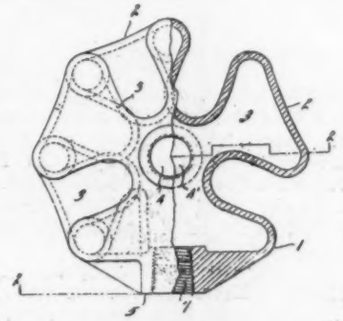
The apparatus consists essentially of two parts, a horizontal retort or reaction chamber A and a vertical chamber 11 for the collection of the carbonized ma-



terial. The feed to the reaction chamber is shown at the end 3 and consists of a piston feed arrangement which is driven by the gear wheel 5 and which moves a certain definite amount of coal from the feeding hopper 6 into the horizontal retort. The opposite end of the coal charge in this retort comes into contact with the flame of burning fuel from the burner 12 and this produces carbonization of the combustible, the gases of combustion escaping through the opening 8. The burning gases are passed through a mass of coal in opposite direction to its own travel and hence a zone of carbonization is established, as at B, which zone is stationary. This means that as the coal reaches this point in the horizontal retort it is carbonized and the rate of feed is such that the location of this point is unchanged during the operation of the apparatus. This process is patented by G. W. Wallace, San Francisco, Cal., in U. S. Patents Nos. 1,639,390, 1,639,391, and 1,639,417.

Water Heater Unit

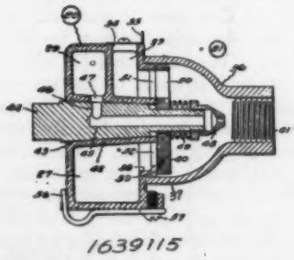
The water heater unit, which is shown in the accompanying illustration, comprises a pair of hollow spiders. The outer ends of the members of each of these spiders are broadened and overlap those of the other spider. Adjacent



members, one of each spider, are provided with openings in a common face and each remaining member of each spider communicates with two members of the other spider. U. S. Patent No. 1,639,002. L. R. Mendelson, Cleveland, O., assignor, The Hotstream Heater Co., Cleveland, O. Filed Sept. 22, 1926.

Natural Gas Burner

The illustration shows a burner which is adapted to burn a natural gas. A conduit is provided for supplying natural gas to the burner and also one for supplying producer gas to it. An opening is also provided for air connection. One valve is provided for controlling comunication of the natural gas and the



air with the burner and another valve for controlling the communication of the producer gas conduit with the burner. The valves are so constructed as to control in a selective manner the supply of the different gases to the burner. U. S. Patent No. 1,639,115. H. F. Smith, Dayton, O., assignor, The Gas Research Co., Dayton, O. Filed July 10, 1924.

Taken from Previous Issues of the American Gas Journal

TEN YEARS AGO

Philadelphia Council, at the first regular fall meeting, started a move to apply the 5-cent rebate, which, under the agreement with the United Gas Improvement Company, will be paid back to the city on all gas sold after January 1, 1918, to the relief fund for the families of soldiers and sailors.

Isaac D. Hetzel, chairman of the committee on relief, introduced a resolution to that effect in select council, and the question was referred to the finance committee.

Oscar H. Fogg, who for some time has been engineer of utilization at the Consolidated Gas Company, with offices at 130 East Fifteenth Street, New York City, has recently reported to Washington for service in the Army. Mr. Fogg has been made captain in the Ordnance Department and expects to sail for France very shortly.

The bringing in of another gas well recently of 25,000,000 cubic feet capacity daily by the United Fuel Gas Company, a subsidiary of the Columbia Gas and Electric Company, makes the total capacity of the latter company 1,236,000,000 cubic feet per day.

Detroit faces a possible gas famine unless coal comes quickly. At the Detroit City Gas Company it was said recently that the demand for gas is far above normal. "We can't heat the city, and if the demand is made on us we will not be able to furnish the gas," it was said. "Also, we are drawing heavily from our reserve supply of coal used in making gas, and unless we get more coal soon our supply of gas may fall short." Gas heaters are selling heavily, but the company discourages their sale, as it cannot furnish enough gas for all the stoves.

TWENTY YEARS AGO

The Consumers Gas Company of Atlantic City, N. J., has awarded to the Gas Machinery Company of Cleveland, Ohio, the contract for a purifying equipment up to a capacity of 200,000 cubic feet per diem. To an impartial observer it looks that it is up to the Atlantic City concern to order the erection of a suitable storage holder. That useful vessel will certainly be needed next season.

The Fitchburg (Mass.) Gas and Electric Company has issued notice that hereafter customers using prepayment meters are to be held responsible for moneys taken from the boxes by thieves. The order has aroused much unfavorable comment, and its legality will undoubtedly be tested through due process of law.

Here is a testimonial to the unerring sagacity of Mr. H. L. Doherty, as per the Columbus (O.) Journal of recent date: "On the initial trip of the Lusitania Mr. Doherty was a passenger, and he won the first pool on the run of the steamer, amounting to $1,000. He then won the second day's pool of $1,500 and the third day's pool of $750. The other passengers began to look upon Mr. Doherty as a wizard, but he saved his reputation by losing on the fourth day."

FORTY YEARS AGO

A most interesting exhibit at the Chicago (Ill.) Exhibition is that made by the Chicago Gas Stove Company. The "dollar gas" that prevailed during the protracted war of gas rates in the wonderful Metropolis of the West taught one important thing to the Chicago housewife—that a gas cooker was and is an unalloyed blessing.

The American Meter Company is under contract to furnish 4-ft. station meters to the gas plants located at White Plains, Rye and Portchester, N. Y.

Owensboro, Ky., is not an exceedingly large place, but it seems to have sufficient attraction for gas works builders, or speculators in such operations. At any rate, the owners of a new company chartered for the locality purchased a plot of land whereon to erect a works, the site selected being in the neighborhood of St. Stephens Church—a part of the city where many small residences are located. The church congregation and others of the surrounding property holders have addressed a petition to the City Council strongly remonstrating against the granting of a building permit, claiming that a gas works would not only be a great nuisance, but would also seriously impair the value of their property.

Brother Jenks evidently thinks that gas is going to hold its own yet awhile with other illuminating agents now and likely to be furnished within the precincts of the quaint and pleasing borough of Woonsocket, R. I., for we note that he is taking up a two-inch main at the northerly end of Grove Street and replacing it with a three-inch one. The latter sized pipe will be laid on Carrington Avenue, from Grove Street, running easterly, and also extended down Grove Street to Willow Street, and at its junction with Grove to Park Avenue

SIXTY YEARS AGO

According to a Swiss journal, a means has been discovered of utilizing cockchafers, or, as they are more commonly called, "June bugs." The Estafette of Lausanne states that between four and five millions of these insects were recently sent to Friburg for the manufacture of gas, and the residue forms an excellent carriage grease.

We understand the citizens of Knoxville, Tenn., after a long period of comparative darkness, have again the pleasure of gas illumination in the place of kerosene, "tallow dips," etc. The works had been so completely destroyed during the war that the company were put to great labor and expense to revive the works. Since the present directors assumed the management of the company they have had to erect a new holder, repair the well, put up new benches, furnish new retorts, and, in reality, erect almost entire new works, excepting the buildings. The local papers speak highly of the improvements and the quality of gas.

This work was under the superintendence of Mr. James Somerville, of Maidstone, England, late of the Government Works of Calcutta, India. The committee on gas of Knoxville reported that there were 241 street lamps in October, 1866. Since that time the pipes have been extended more than a mile. Forty-two new lamp posts have been put up under an appropriation of the city council, making the number of lamp posts now in use 282. Five lamplighters are employed to light and clean the lamps. The local papers are calling for more street lamps, made necessary on account of the increase of population.

CLICK—NEVER TOO COLD NEVER TOO HOT—CLICK

THE MILLION DOLLAR THERMOSTAT

AT CHICAGO

DURING the ninth annual Convention and Exhibition of the American Gas Association, to be held at the Stevens Hotel in Chicago, from October 10 to 14, we will exhibit this remarkable thermostat, in some of its many interesting adaptations.

The same organization that has so successfully adapted this fundamentally new invention to many household and industrial appliances is now engaged in solving the heat controlling and safety problems of gas appliance manufacturers.

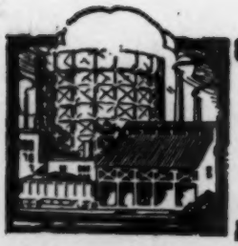
Successful applications include The Electrolux Servel Gas Refrigerator—The Westinghouse Automatic Flat Iron, Coffee Percolator and Waffle Iron—The Bishop and Babcock "Motorstat"—Thermostatic Steam Traps —Air Relief Valves—Automatic Pilot Light and Burner Controls—Automatic Gas Burners—Water Heater Thermostats—Temperature Relief Valves.

IN BOOTH No. 119

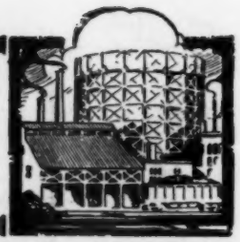
SPENCER THERMOSTAT COMPANY

SPENCER KLIXON CONTROL

CAMBRIDGE, MASS., U. S. A.



NEWS OF THE GAS INDUSTRY



Supreme Court Rules Regarding State Taxes on Natural Gas

A privilege tax levied by the State of West Virginia upon the entire natural-gas production of a company operating within its borders is valid, regardless of the place of sale of the gas. This, in effect, is the ruling of the Supreme Court of the United States in the important case of the Hope Natural Gas Company, which appeared as plaintiff against the State Tax Commission of West Virginia, in a decision rendered recently. Thus the highest court in the land confirms the State Supreme Court and authorizes the State to collect a tax upon the entire natural gas production within West Virginia, despite the fact that much of this production is ultimately sold outside of the State.

The chief objection raised by the gas company to the tax was that it applied to the entire value of the production, regardless of the place of sale. The original trial court enjoined such taxes, holding that the tax was a burden upon and an interference with interstate commerce. But the State Supreme Court, now upheld by the United States Supreme Court, holds that such a tax is not an undue interference with interstate commerce, provided the amount of the tax is determined by the value of the production within the State, before it enters into interstate business. The language of the court on this point is as follows:

"If the taxation value of the products named in the statute be limited to their value in the State, and before they enter interstate commerce, the statue does not manifest a purpose to violate Article I of the Federal Constitution, and so we hold.

"We therefore hold, under the facts in this case, that the defendants may not treat the gross proceeds of plaintiff's sales outside the State as the worth of its gas within the State, but that they may enforce the Act upon the value thereof within the State, and before it enters interstate commerce. The injunction herein will be accordingly so modified."

This decision has a far-reaching effect, because it applies not only to natural gas companies, but also to other persons engaged in the business of mining or producing mineral products and timber of all classes. Speculation has, of course, arisen among commentators on the decision as to whether this finding may not greatly encourage state bodies to tax natural resources produced within their borders. Such taxation might, some feel, extend even to imposition of levies upon all coal, oils and mineral resources produced, thus, indirectly at least, augmenting the price to original purchasers and hence throughout the trade industry, even to the ultimate consumer.

Customer-Owned Coal Mines Have Large Output

About one-fifth of the bituminous coal mined in the United States is produced at mines owned or operated by the principal coal user concerned. Out of this production less than 10 per cent was actually sold near the mine or in the open market in competition with commercial mines.

These results are reported by the Bureau of Mines for operations during the years 1924 and 1925. There is every reason to believe that the trend in production recently has been toward a greater output from consumer-owned properties. The details for 1924, the latest year from which final figures are available, show the following interesting facts:

Mine Owner	Coal Production (millions of tons)
Railroads	33.6
Public utilities	4.6
Steel and by-product coke plants	60.2
Other industrial consumers	8.6
Total	107.0

Of this total about 10.5 million tons were sold; the balance was used by the producing company in its own business.

Peoples Gas Uses Radio

In conjunction with other utility companies, Peoples Gas Light and Coke Company, of Chicago, has purchased and is now operating radio stations WENR and WBCN, through the corporation Great Lakes Broadcasting Company. In addition to the general entertainment and information features there will be special daily features on subjects of interest to the utility companies. A regular program on home service is presented daily.

Ford Plant at Green Island to Use Immense Quantity of Gas

Start of a new enlargement program to make the Green Island plant the largest distributing unit of the Ford Motor Company in the East was marked by word that a pipe line connection is being laid from the Hudson Valley Coke and Products Corporation in South Troy, which will within three months supply the plant with 1,500,000 cubic feet of gas daily.

This scale of gas delivery, to be used in sixteen gas furnaces for the manufacture of batteries, is to be moved up within six months to 3,000,000 cubic feet of gas daily. This, it is said, will make the Green Island plant the largest industrial user of manufactured gas in the East, not excepting those in the metropolitan area of New York City. This is approximately equal to the amount of manufactured gas used in Albany and twice that used daily in Troy.

Gas experts stated that the largest industrial user of gas in New York City is the Ward Baking Company, which has three plants using 1,000,000 cubic feet daily each. The delivery of 3,000,000 cubic feet to the Green Island plant will be, it is said, an extraordinary record for any single plant in the United States.

In preparation of the expansion of demand necessitated in part by the introduction of battery making at Green Island, the Hudson Valley corporation is completing a new water gas manufacturing unit, which brings the number of units to three. The maximum gas output of the company is around 15,000,000 cubic feet daily.

Illinois Power and Light Corporation To Move Into New Home

The Illinois Power and Light Corporation, East St. Louis district, is about ready to move into their new home in East St. Louis's first up-to-the-minute office building. The opening, according to Wm. H. Matlack, sales manager for the company will be one of the biggest parties ever staged in East St. Louis, and it will be proclaimed by a special six-page section in one of the local newspapers. Martin R. Noack is the local manager of the company.

3 Headliners IN THE Star Cast of the Welsbach "MILLION DOLLAR BURNER"

Price, appearance and performance

—Here in the Welsbach line is the greatest combination of these three important points. The famous Welsbach burner assures a flexibility that is essential to gas companies.

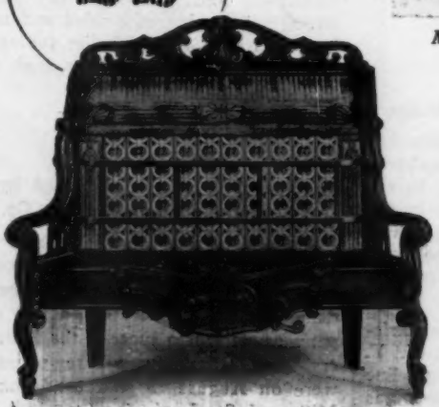
Unusual efficiency is maintained under all conditions. In addition every Welsbach gas heater is packed with selling appeal. Each one carries a price tag that amazes the shopper with its reasonable cost. In appearance, nothing finer was ever offered.

WELSBACH COMPANY, GLOUCESTER CITY, N. J.

OFFICES IN PRINCIPAL CITIES

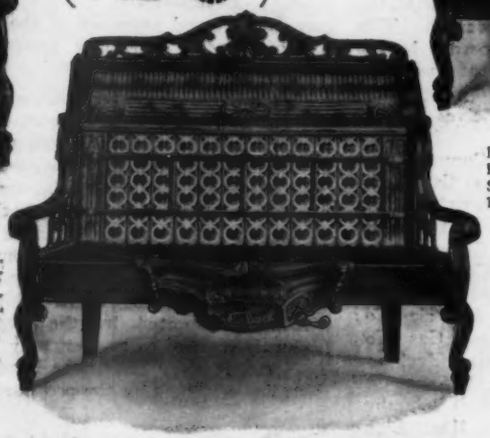
Member American Gas Association

$22



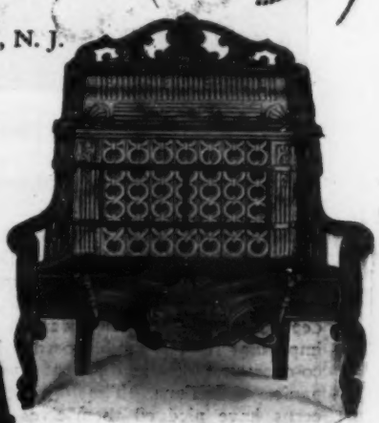
No. 47—Ten glowers. Finish: Silvered Brown. Columns beautifully tinted. Size: 23 inches high, 24 inches wide, 11½ inches deep.

$28



No. 49—Twelve glowers. Finish: Silvered Brown. Columns beautifully tinted. Size: 23 inches high, 28 inches wide, 11½ inches deep.

$15



No. 31—Seven glowers. Finish: Silvered Brown. Columns beautifully tinted. Size: 23 inches high, 20¼ inches wide, 11½ inches deep.

New Jersey Association Holds Successful Outing

One hundred and ten members of the New Jersey Gas Association and friends gathered at the Cohanzick Country Club and thoroughly enjoyed the annual outing of that association. The arrangements for the day were in the hands of a committee of which Mr. Jacob B. Jones was chairman.

It was a day of pleasure. There was no serious business transacted. The splendid chicken dinner served in the club quarters was very conducive to merriment, as the chicken was good and the portions were plentiful.

Charles Erenseller, of Philadelphia, assisted in the song leading, and between Mr. Durgin and him a number of novelty songs were enjoyed. Miss Grace Hettinger, of the office of the Bridgeton Gas Light Company, sang a number of selections in which the assemblage joined in the choruses of several.

Immediately following the dinner a short film on resuscitation was shown by Mr. A. J. Van Brunt, safety director of Public Service.

During the morning most of the visitors played golf and after the film a large number of them took part in a putting contest.

At the close of the dinner a rising vote of thanks was given to Mr. Jacob B. Jones for his splendid arrangements.

Indiana Association Contributes to Purdue

The Indiana Gas Association has contributed $50,000 to Purdue, payable $10,000 a year for five years, in order to strengthen and enlarge the work of the department of gas engineering. This important fund is made possible by the co-operation of the different gas companies of Indiana. The following concerns have pledged themselves to participate in the project:

Central Indian Gas Company, at Muncie; Southern Indiana Gas Company, Evansville; Northern Indiana Public Service Company, Fort Wayne; Interstate Public Service Company, Indianapolis; Citizens Gas Co., Indianapolis; Northern Indiana Power Co., Kokomo; Wabash Valley Electric Co., Shelbyville; Central States Gas Co., Vincennes; Northern Indiana Fuel and Light Co., South Bend; Indiana Gas Utilities Co., Terre Haute; Columbus Gas and Light Co.; Gary Heat, Light and Water Co.; Greencastle Gas and Electric Co.; Rochester Gas and Fuel Co.

Steps are being taken at the university to develop a program of work in gas engineering in all three branches—instruction, extension and research—all of direct benefit to the public.

Petition Granted to Extend Mains

The Public Service Commission has granted the petition of the Lockport Light, Heat & Power Company to extend its gas distributing system in the towns of Lockport and Pendelton, Niagara county, and approved of the exercise of franchises therefor granted by the respective town boards.

This company now furnishes electricity, gas and steam in Lockport, N. Y. It proposes to construct a 6-inch gas line for the transmission of coke oven gas from the town of Tonawanda, through the towns of Pendelton and Lockport to the city. The company has a contract with the Semet Solvay Company by which two million feet of gas per day will be available to it. This gas will be transported by the Republic Light, Heat & Power Company from the Semet Solvay plant to the Pendelton town line and then by the proposed line to Lockport.

The Lockport company has furnished gas in Lockport for many years and has obtained franchises in the towns of Cambria, Hartland, Royalton and Wilson, as well as Lockport and Pendelton. It now operates a water gas plant which the new arrangement will probably replace.

Wrought-Iron and Steel Pipe and Tubing Standardization

The ever-increasing use of wrought-iron and wrought-steel pipe for industrial and domestic uses makes it desirable to have nationally recognized standards of design, dimensions and materials for such pipe and tubing.

A large amount of preliminary work has already been done in this direction, but in order to develop unified nationally recognized standard specifications, all existing standards and specifications will now be thrown into a common pool and a representative sectional committee containing delegates from every important interest concerned will carry on a large program of standardization under the auspices of the American Engineering Standards Committee. The American Society for Testing Materials and the American Society of Mechanical Engineers will act as leaders in this work and will proceed promptly with the organization of the sectional committee.

The special committee on this subject, headed by W. J. Serrill, of the United Gas Improvement Co., Philadelphia, Pa., recommended the following scope for the work:

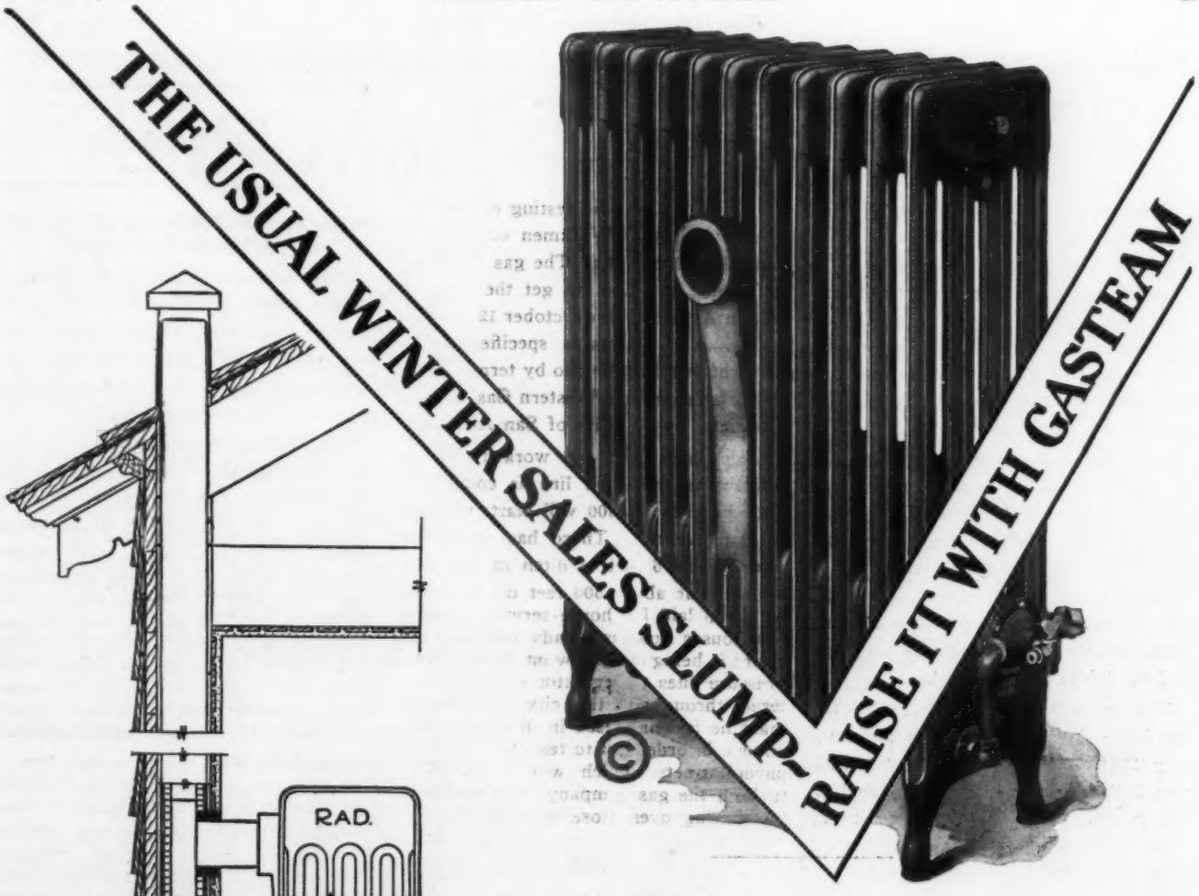
"Standardization of the design, dimensions and material of welded wrought iron pipe, of welded and seamless steel pipe, and of boiler tubing, including pipe and tubing for high temperatures and pressures."

Articles of Incorporation Filed by the Southern Indiana Utilities Co.

Articles of incorporation have been filed in the office of the county recorder at Corydon, Ind., by the Southern Indiana Utilities Corporation, a new company organized to succeed the Railroaders' Gas Company, whose properties were on August 15 sold to Arthur G. Miller of St. Louis for $160,000 in a mortgage suit brought by the Kentucky Pipe Line Company.

The articles of incorporation provide for a capital stock of 15,000 shares of common stock without nominal value and 3,000 shares of preferred stock of $100 par value. The board of directors consists of Mr. Miller, C. N. Vancleave and D. M. Patrick, both of Indianapolis. The corporation is to produce heat, light and power for towns and cities in that section of the state and to drill and operate gas wells. About thirty-five producing gas wells now are in the fields of that county, which have been supplying gas to surrounding towns and to Louisville, Ky.

THE USUAL WINTER SALES SLUMP—RAISE IT WITH GASTEAM



Showing how the Clow Vented Radiators end the moisture problem that has held back gas heating in many sections of the country.

Switching Your Heating Sales Force to Clow Gasteam
Can Raise That Winter Sales Slump

Winter is usually a dull—and unprofitable—time for the gas heating salesman. Naturally, big heating systems won't be installed in the winter.

Every cold day is a sales day, because: stores, restaurants, offices, etc., do not require heat till later in the fall—because Clow Gasteam can usually be installed in one day — because cold days bring out the need for such a heat as Clow Gasteam.

Switch your sales force to Clow Gasteam Radiators this winter — keep your sales force together — raise the winter sales slump — and bring up your seasonal heating load.

Gasteam is practical for stores, offices, factories and public buildings. It provides the amount of heat needed, when it is needed.

Send for our new catalog.

JAMES B. CLOW & SONS
201-299 North Talman Avenue, Chicago

The most complete approval and lines.

43 styles, models and sizes of Clow Gasteam are approved by the A. G. A. and Underwriters' Laboratories.

CLOW GASTEAM

STOCKED IN EVERY SECTION OF THE COUNTRY

Great Speed Made in Supplying San Angelo, Texas, with Gas

Natural gas will be available in San Angelo from the Coleman County gas fields by October 1 and probably before then, according to officials of the Western Gas Service Company, which has the franchise to supply San Angelo with this product. The company lacks but two miles in completing its 70-mile pipe line to the gas wells.

Fifty-one miles of pipe has been laid by the pipe-laying crews, which have closely followed the ditch-digging machine. They have, in turn, been followed by welding crews, which have completed forty-two miles of joining and thirty-four miles of lowering and back-filling. All the pipe is on hand and no delays are expected.

The crews have made a speed of 10,000 feet a day, on an average, and with only 150,000 feet more to go, it is estimated the work will be completed in two weeks. Following that a week will be given over to the testing of the line filled with gas. Workmen on the line number 500 persons. The gas company is making an effort to get the product in San Angelo before October 12, as that is the day the gas is specified to be brought into San Angelo by terms of the franchise given the Western Gas Service Company by the City of San Angelo.

City lines will be worked on as quickly as the main line is completed and the crew of 500 will start working in San Angelo. There has been dug already 45,495 feet of ditch in the city, and all but about 500 feet of the main has been laid for house service. About 100 houses now are ready for the gas. Work is being done now on intermediate pressure lines to regulator stations scattered throughout the city. A boring machine is being used in digging under streets, in order not to tear up the city's paved streets, which would be costly to both the gas company, city and people driving over those streets.

Natural Gas Turned Into Banning Mains

Natural gas was recently turned into the mains of the Twin Cities Gas Company, supplying the communities of Banning, Beaumont, Hemet and San Jacinto, California.

Banning and Beaumont originally had artificial gas plants, but financial and other difficulties led to an investigation of the advisability of bringing in natural gas.

The gas now being used is from the Whittier oil fields, and is the same as that received by San Bernardino, Riverside and Redlands. Later in the season when more gas is required, the Los Angeles basin fields are available, but most important is the fact that Banning is actually connected with the great Ventura and Kern County fields, which are the greatest potential gas fields in this country, and bid fair to supply an almost inexhaustible supply of gas.

Joseph M. Berkley is president of the Twin Cities Gas Company.

Yankton, S. D., Gas Plant is Sold

The local plant of the Yankton Light and Heating Company has been sold to the Federal Public Service Corporation of Chicago, Ill., the deal having been closed in September, according to Charles Smith, manager of the firm.

Mr. Smith will continue as manager of the Yankton plant and has indicated that for the present no change will be made in the personnel or policies of the company.

The officials of the local plant declined to make public today the amount involved in the sale of the property. It is expected that the policies of the new company, should they decide to change those at present in force, will be made after an inspection of the local plant conditions is completed.

Government Publications

Production of By-Product Coke and Coke By-Products in 1926. Mimeographed statement issued by the Bureau of Mines giving final annual figures.

Petroleum Refineries in Foreign Countries, by John H. Nelson. Bureau of Foreign and Domestic Commerce Trade Information Bulletin 494. 10 cents.

Procedure for Testing Hose Masks for Permissibility, Bureau of Mines Schedule 19. 5 cents.

Producing Small Bubbles of Gas in Liquids by Submerged Orifices, by C. G. Maier. Bureau of Mines, part of Bulletin 260. 30 cents.

Personals

Stace Appointed Director of Committee on Public Information

Appointment of Arthur W. Stace, of Grand Rapids, as director of the Michigan Committee on Public Utility Information, with offices in Ann Arbor, was announced by A. C. Marshall, Detroit, chairman of the committe.

The committee was formed in 1920 by the Michigan Gas Association and the Michigan Electric Light Association for the purpose of providing responsible information on utility operation and to promote public understanding. Through its bureau speakers are furnished for clubs and schools; happenings and developments in the field of gas and electric service are furnished to the press, and teachers and students preparing courses of study, books or papers are provided with data upon request.

Mr. Stace was the first president of the Michigan Associated Press Editorial Association, and is a graduate of Notre Dame University. In his new position he succeeds Alfred Fischer, who resigned April 1, to become affiliated with the Semet-Solvay Engineering Corporation, New York.

J. W. Busch Is Made Assistant Vice-President of Illinois Power and Light Corporation

The announcement has been made by the Chicago office of the appointment of J. W. Busch as assistant vice-president in charge of the merchandising activities of the following company groups: Central Illinois, Northern Illinois, Western Illinois, Southern Illinois, Missouri, Iowa and Kansas.

Mr. Busch graduated from the University of Michigan, receiving both the electrical and mechanical engineering degrees, and afterward completed the apprenticeship course at the Westinghouse shops, East Pittsburgh, Pa. Upon completing this course he became a member of the sales department of Westinghouse Electric & Manufacturing Company, and for a number of years was attached to the Chicago office of that concern as special representative.

About seven years ago he organized the first merchandising department in the Westinghouse Company and was its manager for several years. At the time of coming with the Illinois Power and Light Corporation he was assistant district manager of the Chicago district for that company.

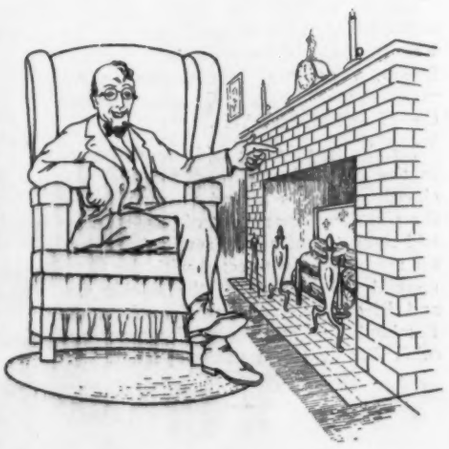
"Andy Iron" Says—

"When chilly blasts swirl down city streets, I sit afore my Homestead 'Woodfire' an' think how pore ole Dad an' me used to hew an' saw the logs for our woodfire in the bygone days. How Ma would scrape up the ashes an' be cleanin' everlastin'ly.

"But they wuz a lot of comfort an' cheer when the family wuz all gathered aroun' the ole log fire an' the yeller flames lit up the room an' the shadders danced along the walls an' ceilin'.

"Yes, sir! They wuz warmth an' contentment, an' beauty, too, in the ole log fire; same as the 'Woodfire' I'm now enjoyin'. We get the identical same effect by just strikin' a match an' turnin' the gas cock—Mandy has no cleanin' to do an' my gran'darter Helen sez, 'It's the ultimate in appropriate decoration,' whutever that means."

Yours truly
Andy Iron



Taking Profit Out of a Hole

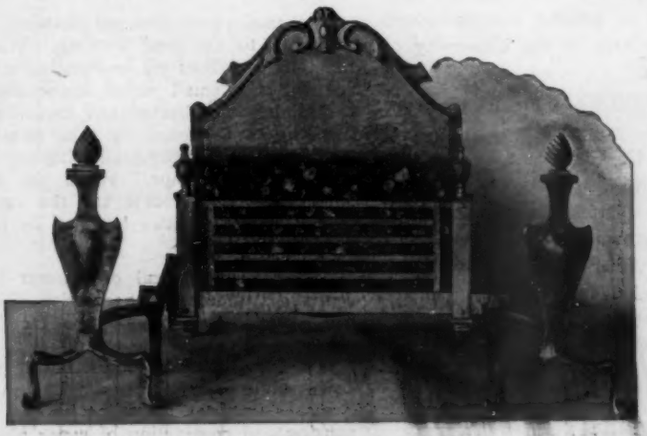
That's just what it amounts to when you fill those numerous empty black holes known as fireplaces with Homestead Fires.

It doesn't require any super-salesmanship to sell Homestead Fires. They are what folks with artistic taste are looking for, to add that last touch of decorativeness to their homes. Homestead Fires fit in admirably with any decorative motif.

Homestead "Woodfires" are as true an interpretation of the log fire of old as it is possible to make them. Truly astonishing is the color and texture of the bark, the hewn logs, the knots even. Furnishing abundant radiant heat when lighted and unsurpassed for naturalness when "cold."

Homestead "Coalfires" are reminiscent of the early English coal fires of the days of Dickens. Giving forth a lively warmth through their mass of glowing coals. They, too, possess a charm that is most appealing.

Hence, Homestead "Woodfires" or "Coalfires" are both potential profit producers. Better stock them.



Homestead "Coalfire"

Be sure and see these Homestead Fires in BOOTH 71 at the Chicago Convention

HOMESTEAD HEATER COMPANY, Inc.

Selvage Street and Fabyan Place WALTER KENNEDY, PRESIDENT **Newark, N. J., U. S. A.**

E. V. Daily Joins L. J. Mueller Furnace Company

Mr. E. V. Daily has recently been appointed Pacific Coast distributor for Gas-Era Warm Air Furnaces and Gas-Era Steam, Vapor and Hot Water Boilers, manufactured by L. J. Mueller Furnace Co. of Milwaukee, Wis.

Mr. Daily enjoys a wide acquaintance in the gas industry, and for the past eleven years has served as manager of the Gasteam department of Jas. B. Clow and Sons of Chicago. Previously he was for many years connected with the Commercial Department of the Pacific Gas and Electric Co. of San Francisco, the Portland Gas and Coke Company and other Pacific Coast gas properties.

Carroll to Leave Laclede Gas Co.

Vincent M. Carroll, for the past four years director of public relations of the Laclede Gas Light Company, St. Louis, has resigned his position with that company effective September 15th, at which time he will accept a position with the Southwestern Bell Telephone Co. of the same city as assistant to the president. Mr. Carroll has instituted many new ideas while with the Laclede company and has given to the gas industry at large some valuable suggestions in connection with merchandising and public relation work.

Ganser Elected General Manager of Philadelphia Suburban-Counties Gas and Electric Company

Arthur W. Thompson, president of the Philadelphia Suburban-Counties Gas and Electric Company, announced today the election of H. H. Ganser of Norristown as general manager of that company, and the appointment of H. B. Bryans, Norristown, as general superintendent in immediate charge of all engineering and gas and electric operations, and J. W. Heins, Philadelphia, as auditor in charge of all accounting. The operating headquarters of the company will be moved at once from Philadelphia to Norristown.

The Philadelphia Suburban-Counties Gas and Electric Company's territory embraces approximately fourteen hundred square miles in Montgomery, Chester, Delaware and Bucks Counties and includes a population of over 600,000.

Mr. Ganser had been a vice-president of the company in charge of the Schuylkill division, which office he retains. He is one of the best known public utility men in the East, having been in the business for nearly thirty years, beginning as a clerk with the old Norristown Electric Company and advancing through practically all jobs in the business to his present position. He is vice-president of the Montgomery Trust Company and of the Valley Forge Hotel Company, Norristown.

H. H. Ganser

Mr. Bryans, who is well known in engineering circles, had been engineer of the Schuylkill division prior to his appointment as general superintendent. He is a graduate of the University of Pennsylvania.

Mr. Heins has had a broad experience in utility accounting work as a traveling auditor for U. G. I. and as assistam general agent of the Philadelphia Gas Works, which latter position he left to go to Norristown. He is active in affairs of the American Gas Association, having served as chairman of the Accounting Section.

ERRATUM

On page 24 (Frontis) of this issue, showing the officers of the American Gas Association, Clifford E. Paige is listed as Vice-president.

This should read Clifford E. Paige, Treasurer.

Model for Power Show Completed

A model of the exhibit that the gas companies of the metropolitan district are supporting at the Power Show this winter has been completed, and the contributing gas companies have appropriated sufficient funds to make the exhibit a success, according to Mr. A. M. Apmann, vice-chairman of the committee on display and contact with national industrial organizations, Industrial Gas Section, American Gas Association.

The gas companies included in this are the New York and Richmond Gas Company, the Brooklyn Union Gas Company, the Brooklyn Borough Gas Company, the Kings County Lighting Company and the Consolidated Gas Company of New York.

Breather Roof Conserves Oil

A new device has just been developed in the oil industry which gives promise of being a boon to the nation at large as well as to the particular oil and other companies that utilize it. This device is the Wiggins Breather Roof, designed particularly to stop evaporation loss from standing storage tanks.

The Breather Roof is constructed of steel plates welded together much the same as an ordinary steel roof. The distinctive feature of the Breather is that the roof framing is designed so that the roof, when resting on it, dips below the top of the tank shell and forms an inverted frustrum of a cone.

The roof plates are not fastened in any way to the roof framing. When the tank is full of oil in standing storage and the small vapor space above the oil becomes heated and expands it lifts the roof enough to take care of such expansion without allowing any of the vapor to escape. When the hot part of the day is over and the vapor cools, the roof settles back to its former position.

Lately a great deal of interest has centered around the conservation of oil. The conservation practice so far has not been to restrict the use of oil products for legitimate purposes, but to cut down unnecessary wastes. This new Breather Roof, by providing for the expansion and contraction of vapor above oil in a tank, prevents evaporation from standing storage tanks.

Oil companies and others who store oil will benefit greatly by the development of this new roof because it is possible for them to save oil which formerly escaped into the air.

"Sky Scraper Gas Works," Hey?

This is what one gas man says is coming.

Well, if this is so there is only one elevator that can be depended upon to serve the Sky Scraper Gas Works.

THE RIDGWAY ELEVATOR IS THE ONLY ONE THAT CAN BE DEPENDED UPON TO ALWAYS GO.

Endless chain elevator machinery goes bad.

Endless belt contrivances fail at the critical time.

Electrical devices lose the juice when needed worst.

Gas Works always have steam from the waste heat boilers.

And Ridgway Elevators always—but listen

At the Atlantic City Gas Works they put in an electric skip hoist.

The usual electrical troubles.

The Boss said, "Throw that thing away. Send for Ridgway. He's got the only decent elevator for a Gas Works or any other works."

The Ridgway Elevator was installed.

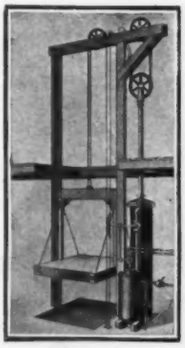
The Superintendent says, "Your elevator is the greatest thing ever put in a Gas Works for hoisting stuff. Performance is perfect."

Be wise and

"HOOK 'ER TO THE BILER"

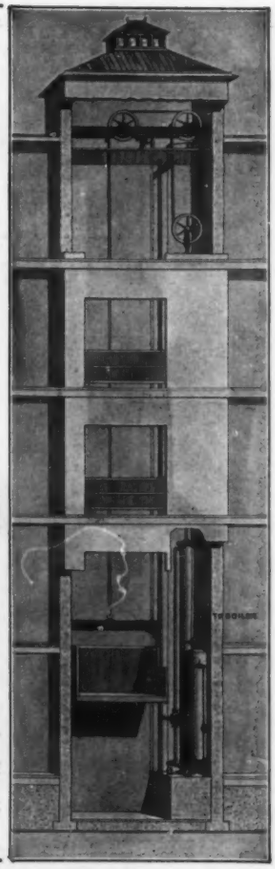
Craig Ridgway & Son Co.

Over 3,000 in daily use COATESVILLE, PA.



Double Geared

Direct Acting



SUPERIOR

Gas Meters
Provers
Service
Cleaners
Diaphragms

SUPERIOR METER CO.
167 - 41st Street
Brooklyn, N. Y.

A. G. A.
REGISTRATION

For the convenience of those attending the Annual meeting of the American Gas Association at Chicago, Ill., week of October 10th, we have arranged to keep a list of those registering from hour to hour, in our booth.

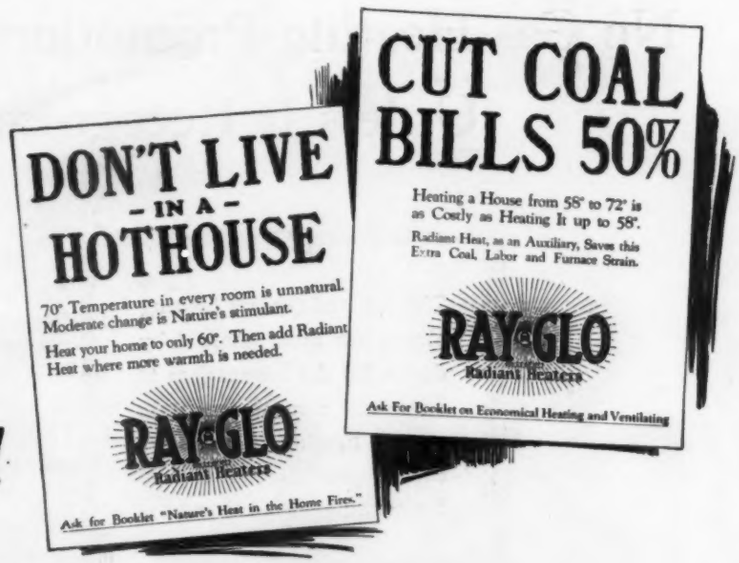
If you are looking for anyone, you can find out at once whether they have registered or not, and at which hotel they are stopping.

BOOTH-9

Ballroom

AMERICAN GAS JOURNAL

Better Health for Less Money!


DON'T LIVE
- IN A -
HOTHOUSE
70° Temperature in every room is unnatural. Moderate change is Nature's stimulant.
Heat your home to only 60°. Then add Radiant Heat where more warmth is needed.
RAY-GLO
Radiant Heaters
Ask for Booklet "Nature's Heat in the Home Fires."
CUT COAL BILLS 50%
Heating a House from 55° to 72° is as Costly as Heating It up to 58°.
Radiant Heat, as an Auxiliary, Saves this Extra Coal, Labor and Furnace Strain.
RAY-GLO
Radiant Heaters
Ask For Booklet on Economical Heating and Ventilating

AUTHORITIES on heating and ventilation are now pointing out that Nature never intended us to live in uniform, unchanging temperatures, that the healthful home keeps different rooms at different temperatures so as to stimulate body circulation and tone.

The gas industry now has an opportunity to sell two kinds of gas heating—(1) Central heating to maintain a basic 60° temperature with convenience and great economy, (2) Auxiliary Radiant heating to keep certain rooms at higher temperatures with relatively small expense.

Ray-Glo Heaters, with their intense incandescence, high temperature flame and complete freedom from air and gas adjustments, fit logically into this plan. For no other appliance can deliver an equal amount of LIVE, stimulating, sun-like energy in so short a time, under all gas conditions and without an adjustment.

These facts, well known in the industry, should be made public. Let us tell people what Radiant Gas Heat will do for them. That will most quickly increase the market for GOOD heaters that deliver permanent satisfaction.

THE J. H. GRAYSON MFG. CO., Athens, Ohio

Copies of a complete report on this subject of heating for health may be had at our Convention Booth, No. 72, or by writing us direct.

RAY-GLO
REG. U.S. PAT. OFF.
Radiant Heaters

EVERY RADIANT HEATER AVERAGES 20,000 CUBIC FEET OF GAS CONSUMED EACH YEAR

No Gas Heating Promotion Plan Is Sound Unless It Recognizes This:

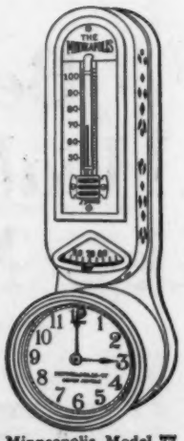
The demand for gas heating plants has been fostered by desire for the advantages of automatic control, to obtain greater heating comfort and end the troublesome task of fire-tending.

Take Advantage of This Trend by Featuring the Minneapolis

The American public recognizes the fact that automatic control is the foundation of modern heating. This is not a new conception. Its development began forty-two years ago with the invention of the Minneapolis Heat Regulator, and it has been growing steadily ever since. Consistent national advertising has identified this trend with the name "Minneapolis," and augmented the word-of-mouth advertising of more than 2,000,000 people who are enjoying the benefits of Minneapolis controls.

It is no exaggeration to say that the Minneapolis has been the forerunner of the newer fuels. Whereas many features of gas heating are still new and strange to your average prospect, the Minneapolis is known, familiar, established in the confidence of the public. And people understand what completely automatic control means—that's why they're ready to consider heating with gas.

Let us tell you how you can capitalize this interest in the Minneapolis in promoting your gas heating sales.



Minneapolis Model 77 8-day 7-jewel clock thermostat

Minneapolis Limit Control. A safety device for furnace or boiler, providing protection against excessive temperature or pressures.

Minneapolis Magnetic Gas Valve

Minneapolis Electric Motor, universally applicable to all types of boilers, furnaces, and conversion burners.

See our exhibit at the American Gas Convention

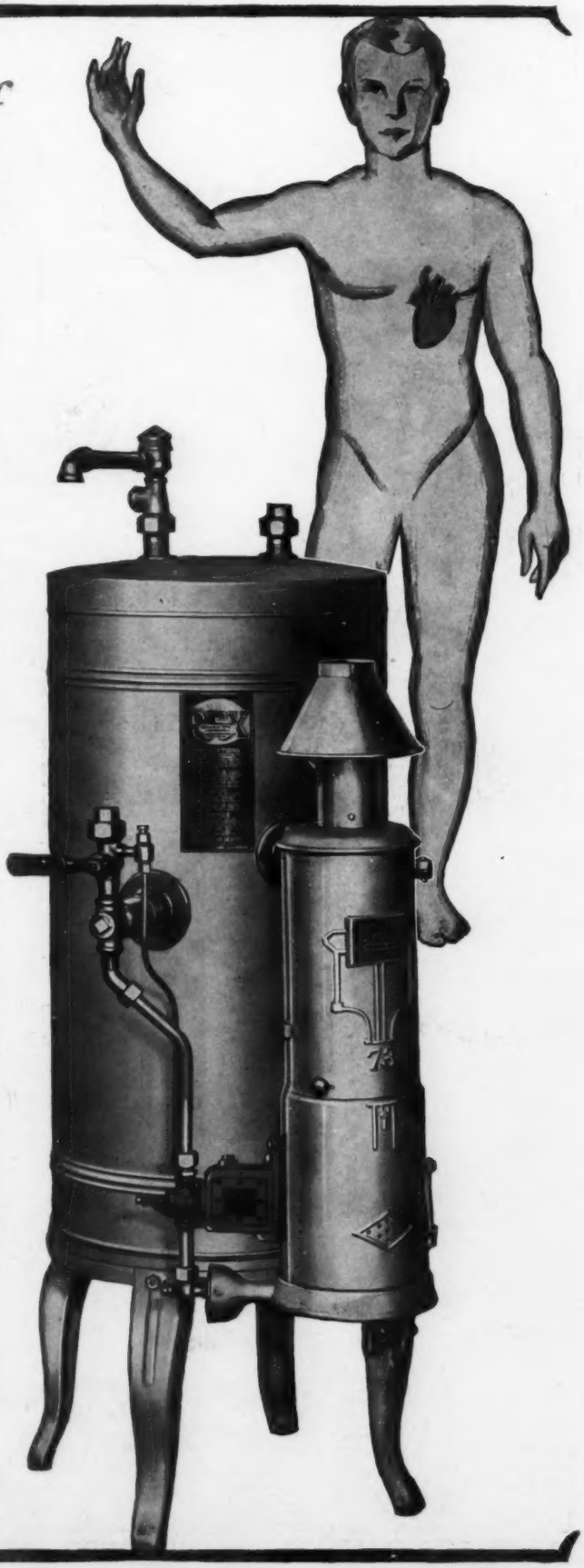
Minneapolis Heat Regulator Company

Established 1885

408 E. 28th St. Minneapolis, Minn.

The "MINNEAPOLIS" HEAT REGULATOR

The HEART of the SYSTEM



AS the heart is the organ of the human body that automatically controls life, so is the Patrol Valve the accessory that properly controls the operation of an automatic water heater.

As the heart is the fool-proof organ of the human body, so is the Patrol Valve the fool-proof accessory of an automatic water heater.

The operation of an automatic water heater is depending upon the operation of the thermostat, and owing to the fact that the thermostat will open whether the pilot light that ignites the main burner is burning or not, an additional control is necessary to assure the safe operation of the system. This operation is performed by the Patrol Valve, as the flame that lights the burner is the flame that operates the Patrol Valve.

The Patrol Valve completes the function of the thermostat as the human heart completes the function of life.

Moreover, as the human heart, the Patrol Valve operates with each operation of the system. When the thermostat closes the Patrol Valve likewise closes, and thus completes the operation. The Patrol Valve is not a device that lies dormant until a dangerous condition arises which requires its protective operation.

A safety valve that only operates in an emergency may not function when called upon. Its mechanism may be corroded or clogged with dust and dirt. When the pilot light is not burning the Patrol Valve is closed and remains closed, because the flame that lights the burner is the flame that operates the Patrol Valve.

The Patrol Valve is the human-like accessory of an automatic water heater. It makes the self-action thermostat safe. Insist upon it.

The Patrol Valve Co.

1501 Euclid Avenue, Cleveland, Ohio

WHERE is the woman who does not yearn for the convenience afforded by a gas range equipped with a modern oven heat control? She simply doesn't exist.

Think of the merchandising possibilities here and then follow the history of the Wilcolator which is today the standard oven heat control on over 90 makes of gas ranges.

Wilcolator on your gas range is a sales asset that builds increasing good will with years of service.

Ask us to send you Bulletin No. 202 for details.

The Wilcolator Company
17-23 Nevada Street, Newark, N. J.

WILCOLATOR
OVEN HEAT CONTROL

At Booth No. 109

A. G. A. *Exhibit*

A Unique Display by

The Wilcolator Company

Originators and Manufacturers of Thermostatic Controls for Gas and Electric Devices

Offices and Factory

17-23 Nevada Street Newark, N. J.

A-B Gas

TESTING LABORATORY AGA APPROVED

Company Member American Gas Association.

Ranges

MANY outstanding features of design and construction have crowned A-B Gas Ranges with unparalleled success. A steady, uninterrupted advancement in sales from year to year testifies to the great saleability of the line.

To meet new conditions which confront the gas industry, we now have ready several additional designs of A-B gas ranges that will amaze you with their sales creating possibilities. The new A-B line gives you the desired "edge" over present day sales resistance. The new units are "reinforcements" in your drive for greater and more profitable gas business.

Write at once for detailed information outlining our co-operative sales plans.

A-B STOVE COMPANY, Battle Creek, Mich.

World's Largest Exclusive Manufacturers of Gas Ranges

Factories at Battle Creek and Los Angeles

Company Member American Gas Association

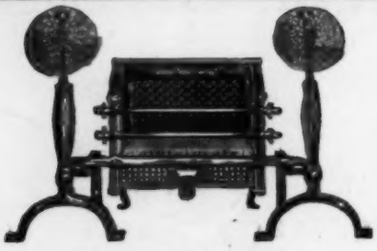
No. 112

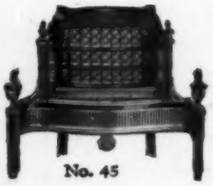
No. 65

No. 60

No. 102

No. 85


Radiantfire Model No. 90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No. 115A

No. 80

Sold and Serviced the World Over

North—South—East—West—Everywhere there are dealers selling and servicing the Humphrey Radiantfire. This is significant in explaining the fact that the Radiantfire is found in well above a million homes today.

The public has placed confidence in Humphrey products for more than twenty-five years. Humphrey appliances have performed an inestimable service in educating the world to the uses of gas. Above all else that name is associated with Radiantfire—a guarantee of healthful and economical heat, *when* and *where* it is wanted, with no smoke, no odor, no dust, no ashes.

The
HUMPHREY
Radiantfire
TRADE MARK REG. U.S. PAT. OFF.

GENERAL GAS LIGHT COMPANY, KALAMAZOO, MICH.
New York - 44 West Broadway San Francisco - 135 Bluxome Street

THE KOMPAK CO.

Automatic Thermostatic Gas Water Heaters

NEW BRUNSWICK
NEW JERSEY

Doing One Thing Well

There are probably one hundred different makes of water heaters on the market. No one concern can possibly make every kind, size and type.

We feel that there is a tremendous potential market for the highest grade, all copper storage heater. By concentrating all of our capital, our experience, our selling, on just the one type, we are able to give the very most for the money.

AT CHICAGO

You will see Kompak Automatic Storage Heaters for every type of building.

ALL COPPER

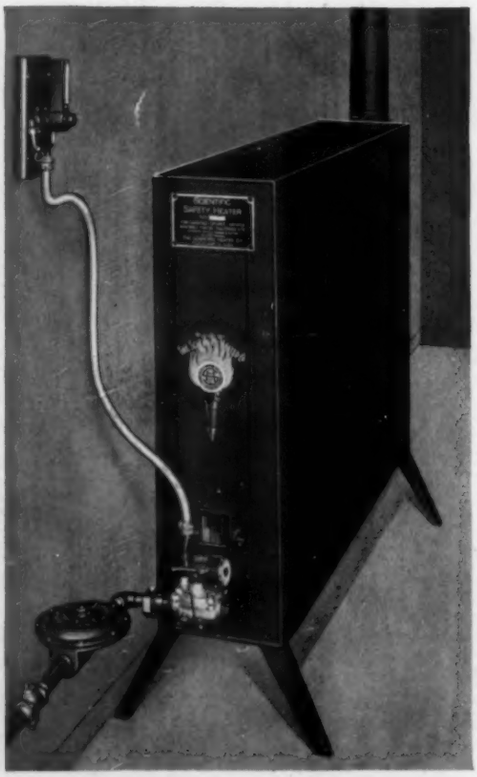
Very truly yours,

THE KOMPAK COMPANY,

H. J. Long,
President

KOMPAK
TRADE MARK REG.

The New Scientific Safety Heater



Entirely New from stem to stern, embracing startling improvements which mark distinct advance in gas appliance design.

New Sizes— for one, two and three car garages — much more convenient range.

New Dress. The new sparkling crackle finish in old mahogany — sprayed on and baked. Very permanent.

New Igniter — Simpler to operate than a match. Absolutely safe. Cannot fail.

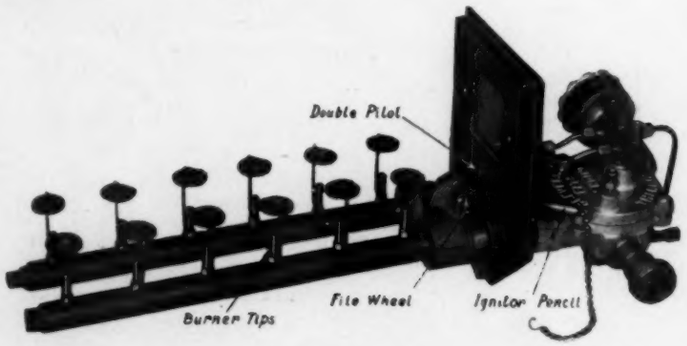
New Thermostatic Control — Snap acting. Factory adjusted — extremely simple, positive and accurate — no wires, electricity or springs.

New Gas Governor-Filter. Assures steady, dependable flow of clean, dry gas. Eliminates service calls.

New Burner. Shown at right. A sensational improvement. Blue flame without air adjustment. Cannot backfire, deposit carbon, puff out pilot, or fail to ignite.

New Double Pilot— a new idea for safety and certainty of operation — one stand-by pilot and one service pilot.

New Master Valve. The final solution to assure simple, fool-proof operation.



New Unit Assembly Idea. Shown above. All "the works" in one self-contained unit, easily withdrawn from heater. Gives complete accessibility. Replaceable with a "spare" in one minute. A new ideal for all gas appliances.

THE SCIENTIFIC HEATER COMPANY

2150 Superior Viaduct, Cleveland, Ohio.

A NEW BLUE STAR

TESTING LABORATORY
AGA
APPROVED

In the A. G. A. Firmament!

PROUDLY this new gas heater wears the Blue Star—emblem of approval by A. G. A. Testing Laboratories.

Proudly it bears the name, Heatrola — without question the best-known name in the field of Warm-Air Heating.

An immediate widening of the field for gas heating has been caused by the introduction of this new appliance, designed to heat three to five rooms by circulating moist, warm air.

Hundreds of companies have ordered samples — many are already actively campaigning.

Estate Gas Heatrola will be exhibited at Chicago. Better still, order a sample now.

THE ESTATE STOVE COMPANY, *House Founded in* 1845 **Hamilton, Ohio**

Estate GAS HEATROLA

There is only *One* Heatrola—*Estate* builds it

THROTTLING CONTROL

Now optional equipment on

IDEAL GAS BOILERS

The No. 596 Throttling Valve

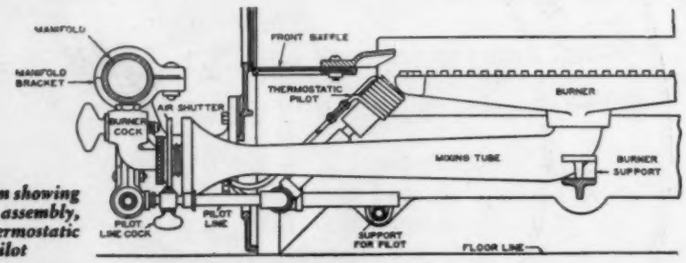


Diagram showing burner assembly, with thermostatic pilot

THE *No. 596* THROTTLING VALVE includes all the functions of the already well-known *No. 600* Snap Action Valve. Either of these valves is now regular equipment on Ideal Gas Boilers. This throttling control provides a gradual and extremely sensitive regulation of the gas supply by means of the Throttling Lever operated either by steam pressure or water temperature regulator.

The burners are never entirely extinguished by the Throttling Lever, a By-pass adjustment providing a minimum flow of gas to the burners. This has the advantage of limiting fluctuation in the gas supply and giving absolutely even boiler control. On the other hand, the valve is completely closed by the action of the Thermostatic Pilot, Low Water Cut-Out, Weighted Valve Pin, or Spring Valve Pin.

The exceptionally flat efficiency curve of Ideal Gas Boiler performance makes the throttling method of control ideal where automatic regulation of the system depends only upon steam pressure or water temperature. This applies particularly to large battery installations, small jobs where the cost of a room temperature thermostat may not be justified, and hot water supply installations.

OPERATION

1. Steam Pressure or Water Temperature Regulator operates Throttling Lever, providing a gradual control of the gas supply.
2. Adjustment of by-pass for minimum flow of gas is provided by means of a screw with locknut under Throttling Lever.
3. Thermostatic Pilot completely shuts off main gas supply should pilot become extinguished or gas supply fail.
4. Weighted Valve Pin completely shuts off main gas supply automatically when connected with Low Water Cut-Out.
5. Main gas supply can also be completely shut off when desired by means of Weighted Valve Pin or Spring Valve Pin.

Comparative tests have shown no measurable difference in fuel consumption under either the Snap Action or Throttling method of control, even when the boiler is operated at less than 20% of rating.

Under average conditions the adjustments of the By-pass should be such that, with the throttling lever in the closed position, the flow of the gas to the burners is not less than 25% of the full rated gas consumption. The actual output of the boiler at By-pass would then be approximately 20% of its rated capacity, considerably less than the amount of heat required to maintain temperature in boiler and piping, but providing instant response to any sudden heating demand.

In cases where it is desirable to have the flow of gas to the burners entirely shut off by the operation of a Room Thermostat or similar control, this can be done advantageously by locating an electrically-operated or mechanical Snap Action Valve in series with and on the inlet side of the Throttling Valve. By this method, gradual and sensitive regulation, according to boiler temperature or pressure, is obtained by means of the throttling lever, and the gas supply is completely shut off by means of the additional valve.

AMERICAN GAS PRODUCTS CORPORATION

Distributors: 376 Lafayette Street, New York City

STYLE B

(Actual Size)

Interchangeable with heat control.

FEATURES

of New Styles A and B

Shows actual Fahrenheit degrees.

Quick-acting thermostatic metal registers correct temperature immediately.

Extreme heat cannot injure or make the thermometer inaccurate.

Style B interchangeable with heat controls.

Carefully calibrated.

Porcelain enamel dials in two colors.

Accuracy guaranteed for the life of the oven.

No glass or mica to get broken.

Economical in price.

Handsome in appearance, add greatly to the looks of any oven.

"Have Given Splendid Satisfaction for Over 30 Years"

This is the opinion expressed by a firm in the West, which has manufactured ranges for 70 years, regarding

THE COOPER OVEN THERMOMETER

Over a quarter century ago this progressive firm was quick to realize the value of a thoroughly reliable heat indicator for their range ovens, and today prominent range manufacturers are rapidly adopting the Cooper Oven Thermometer as

Essential Standard Equipment for Every Gas Range

A true and absolutely *accurate* indication of the oven temperature is indispensable for modern cooking, and the Cooper Oven Thermometer will give this accurate indication at a glance.

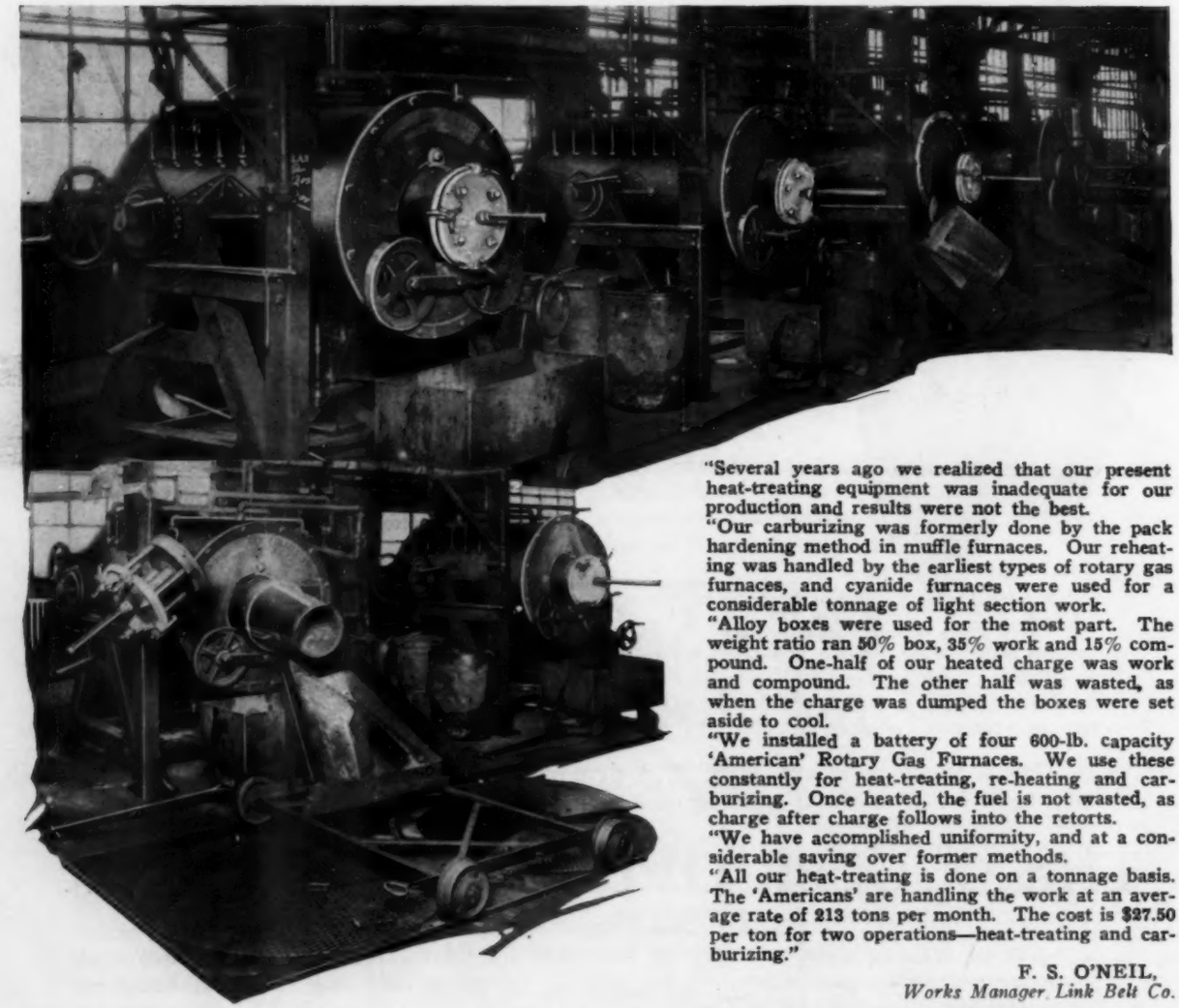
You will readily see what an added influence is here presented for the increased sales of Gas Ranges when equipped with the Cooper Oven Thermometer.

Let us show their many advantages—Booth 67—Basement

THE COOPER OVEN THERMOMETER COMPANY

4 MAIN STREET **PEQUABUCK, CONN.**

What "Link Belt" has to say about "Americans"



"Several years ago we realized that our present heat-treating equipment was inadequate for our production and results were not the best.

"Our carburizing was formerly done by the pack hardening method in muffle furnaces. Our reheating was handled by the earliest types of rotary gas furnaces, and cyanide furnaces were used for a considerable tonnage of light section work.

"Alloy boxes were used for the most part. The weight ratio ran 50% box, 35% work and 15% compound. One-half of our heated charge was work and compound. The other half was wasted, as when the charge was dumped the boxes were set aside to cool.

"We installed a battery of four 600-lb. capacity 'American' Rotary Gas Furnaces. We use these constantly for heat-treating, re-heating and carburizing. Once heated, the fuel is not wasted, as charge after charge follows into the retorts.

"We have accomplished uniformity, and at a considerable saving over former methods.

"All our heat-treating is done on a tonnage basis. The 'Americans' are handling the work at an average rate of 213 tons per month. The cost is $27.50 per ton for two operations—heat-treating and carburizing."

F. S. O'NEIL,
Works Manager, Link Belt Co.

American Gas Furnace Engineers will make an analysis of your heat-treating costs without obligation.

AMERICAN GAS FURNACE CO.

Main Office and Works: Elizabeth, N. J.

We Make

Automatic Heat Controllers
Automatic Quenching Tanks
Blowers
Blowpipes or Blowtorches, Hand and Stand
Boosters, Gas
Brass Melters
Brazing Furnaces and Tables
Burners
Burners for Electric Lamp Bulb Manufacture
Carbonizing Machines
Cyanide Furnaces
Cylindrical Furnaces
Forges
Forges, Glass Bending
Hardening Hammers
Heating Machines
Melting Furnaces
Muffle Furnaces
Oil-Tempering Furnaces
Oven Furnaces
Plating Furnaces
Rivet Heaters
Soft Metal and Lead Hardening Furnaces
Soldering Iron Heaters
Sweep Reducing Furnaces
Tempering Plates
Tire Heaters
Tube-Heating Furnaces
Every Type of Gas Blast Burner, Furnace and Heating Machine for Industrial Uses.

Ready Now

The New AutomatiCook Book --- for which thousands of women have asked . . . .

Hundreds of stove dealers have asked us for it. They felt that as makers of so famous an oven heat controller, we could produce the kind of a book the housewife needed. *Here* is the all-inclusive volume . . . A cook book that tells not only *what* to cook—but *how* to cook—how to prepare hundreds of appetizing, hunger-appeasing things in the surest, easiest way, with the AutomatiCook.

A special proposition for Gas Companies and Stove Dealers

This book carries a price mark of 50c. and compares well with independent publications selling for a dollar or more. We want you to know the special low prices that we have established for Gas Companies and Stove Dealers. Your signature on the coupon will bring this information promptly.

Backed by National Advertising in leading Publications

Robertshaw Publicity in such magazines as the Ladies Home Journal and Good Housekeeping advertises this book to millions of housewives. Remember, many who send for it will not be AutomatiCook users, which means that this book is preparing a market for every manufacturer and seller of Gas Ranges equipped with AutomatiCook.

ROBERTSHAW THERMOSTAT CO.
YOUNGWOOD, PA.

ROBERTSHAW
TRADE MARK
AutomatiCook

ROBERTSHAW THERMOSTAT CO.
Youngwood, Pa.

Please send me complete data and special dealer's prices on the new AutomatiCook Book.

Name .....
Firm .....
Address .....
City ..... State .....

AKme Consuming FLue
FOR GAS RANGES

Consumes Grease and keeps entire kitchen free of the dirt the grease collects.

Keeps the proper oven draft constant.

Prevents Hazards.

The Value of the AKme Consuming FLue, and why it is a necessary appliance for Gas Ranges, according to reports of Gas, Chemical and Combustion Engineers.

What the AKme FLue Does — The AKme FLue consumes the grease that is forced into the air by the oven draft. The Dust and Dirt, which sticks to this grease, is the cause for having to do the walls, ceiling and woodwork over much more often, and doing twice the amount of scrubbing and washing necessary to have a clean, sanitary kitchen. (Grease from cooking over open burners does not ascend, because there is no draft to carry it up.)

Better Cooking — If this FLue is used in place of an unsightly stove pipe connection, the heat is not drawn out of the oven, and the proper oven draft will be kept constant.

Hazards Prevented — *That are not the fault of Gas Ranges*—Oven vents require this FLue to keep people from putting something in or over them.—All methods of venting ranges to the outside produce excessive moisture, which corrodes the inside of pipes. The scale formed, assisted by down drafts, falls, carrying soot, and an elbow of the pipe or the oven vent is stopped, which causes explosions, extinguished burners, and monoxide gas. Improper venting and connections are responsible for more fires than any other one cause.

Construction — This FLue is constructed to conform to the recommendation of the Bureau of Standards. The openings in the stack are a safety feature, which prevents any danger if something is placed on top of the FLue. The metallic fibre, used in the mat, is a catalyzer and induces chemical reaction, which causes combustion.

Standard FLues are for use on ranges where the ovens only are vented. Specially constructed FLues must be used on ranges where the products of combustion from all burners go up and through one vent.

Complete information and proof of all claims will be furnished by:

AKme FLue, Inc.

1517-27 GUILFORD AVE., BALTIMORE, MD.

The AKme Consuming FLue will be on display at the American Gas Association Convention in October. - - Booth No. 78

How to Sell More Gas

And Win the Good Will of Every Home Owner

You will profit three ways by selling the Roberts Gas Burner this Fall. Your appliance department will make an attractive profit on every installation. Your gas consumption will be increased. And you will win the lasting good will of every home owner who takes your advice and installs the Roberts Gas Burner, for you will then be able to show your customers how to heat economically with gas, plus the great comfort and convenience that comes with automatic heating by gas.

ROBERTS

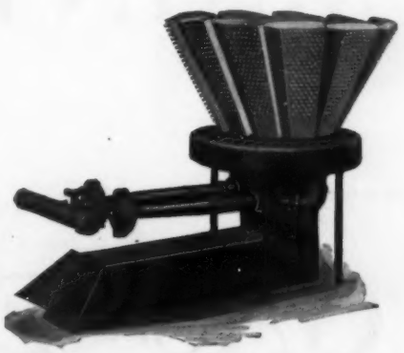
RADIANT TYPE CONTROLLED

GAS BURNER

The more you know about gas burners the more enthusiastic you will be about the Roberts. For it is a trouble-free burner that does not call for servicing after it is installed. Its automatic action is so simple and positive that you can be sure every sale will mean a new friend for the gas company.

The principle of *radiant* heat is utilized to the utmost in the Roberts burner, the radiants directing and "scrubbing" the flames against the firepot walls. The control of the secondary air is a distinct innovation that not only assures complete combustion, but prevents the sudden cooling of the furnace when the gas is shut off.

You should know about the advanced features of the Roberts Gas Burner the very next thing you do. Just drop us a line today and we will send you a complete operating description together with one of the most attractive appliance propositions you have ever received.



Visit our Exhibit at Hotel Stevens Chicago Oct. 10th to 14th

ROBERTS GAS BURNER CORP.

Jackson Building, 128 West Chippewa Street, Buffalo, N. Y.

WELSBACH

STREET LIGHTING

MAINTENANCE

GAS---ELECTRIC

WELSBACH STREET LIGHTING COMPANY OF AMERICA

ROPER

VALUES

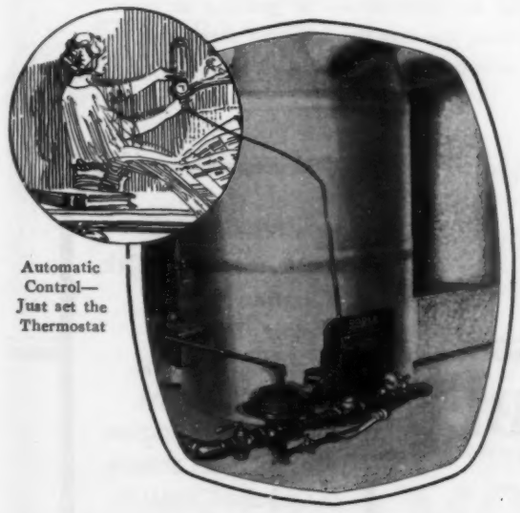
—are setting the pace in gas appliance sales

Far in the lead, the ROPER LINE is speeding to sensational new records in retail gas appliance selling. The Superior values is the factor that has given Roper merchants this clear, outstanding advantage over competition.

Gas Ranges - Furnaces - Radiant Heaters

Now's the time to go after the gas appliance business with full force. Roper Gas Ranges with Complete Oven Control, Roper Gas-Fired, Warm Air Furnaces and Roper Sheetflame Radiant Heaters will help you do it. They will bring home to the public more strongly than ever, the fact that they can do it better with Gas.

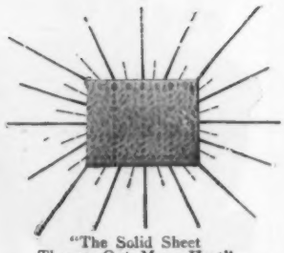
Write for Roper catalog "J", on the complete line of Roper gas appliances. Investigate the profit opportunity this greater ROPER LINE has to offer. Write Now!



Automatic Control—Just set the Thermostat

Convention Booth 54—Ballroom

Roper products are Blue Star approved



"The Solid Sheet Throws Out More Heat"

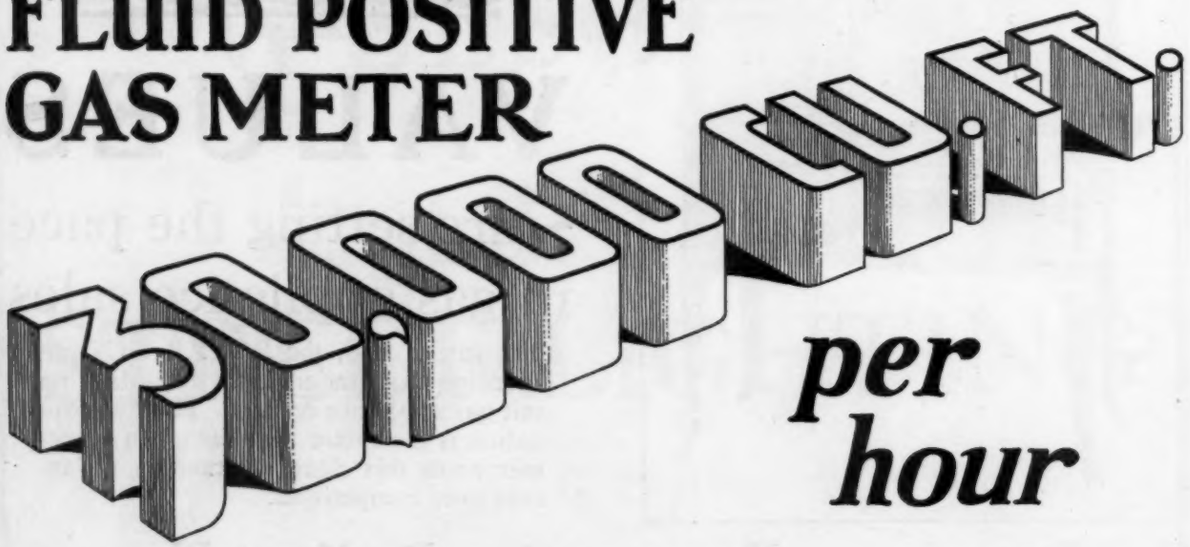
GEO. D. ROPER CORPORATION
Rockford, Illinois
Pacific Coast Branch: 135 Bluxome St., San Francisco, Cal.

Gas Furnaces — ROPER — Radiant Heaters

GAS RANGES
GAS FURNACES

Be sure the Roper Purple Line and the Roper Complete Oven Control are on the Gas Range you sell

WESTINGHOUSE FLUID POSITIVE GAS METER



The reputation of the Westinghouse Fluid Positive Gas Meter has been established for many years. Actual service under the most trying conditions is responsible for its universal acceptance as a standard for accuracy and durability wherever either natural or manufactured gas or air is measured.

The meters are now equipped with interior automatic seal overflow, which prevents over-filling, and automatically drains off any condensate, maintaining the seal always at its proper height.

Should the seal increase, due to condensation of gasoline or other liquid, it will overflow the center cup into the inlet and there may be tapped into a tank or other receptacle through the hole.

WESTINGHOUSE
FLUID POSITIVE
GAS METER

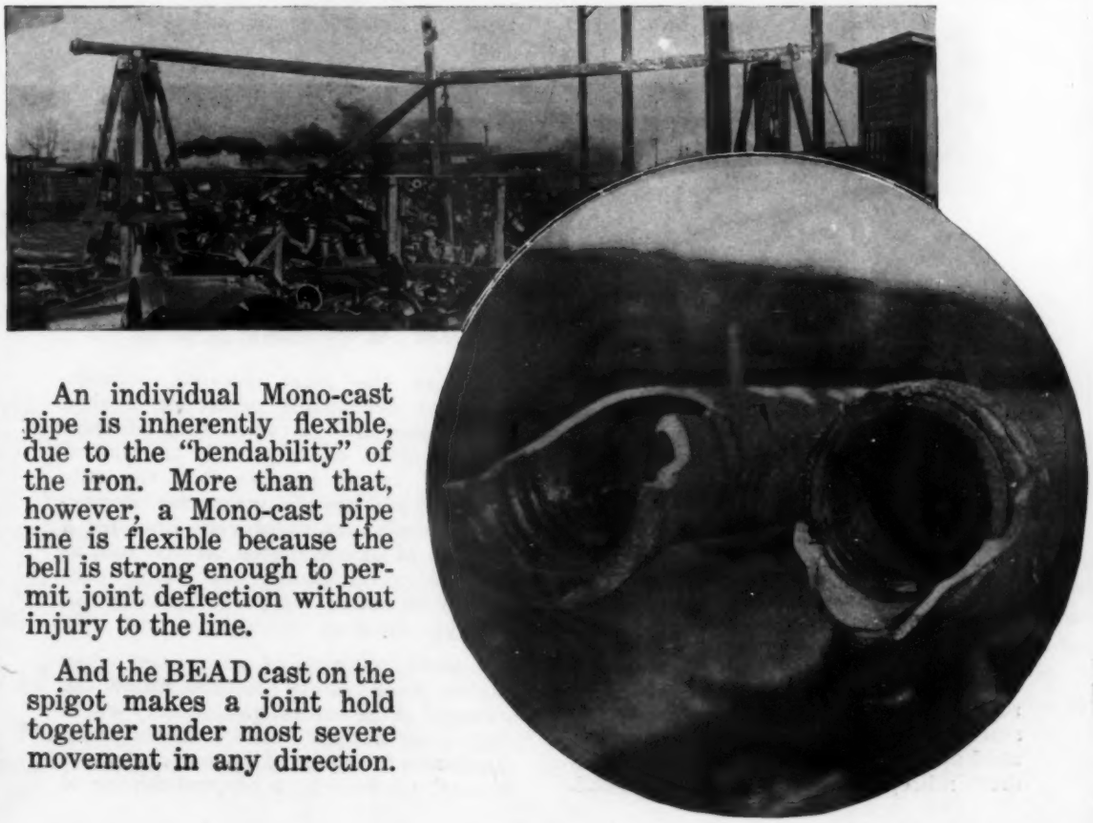
PITTSBURGH EQUITABLE METER COMPANY

PITTSBURGH, PA.

BRANCH OFFICES
New York, New York.
Chicago, Illinois.
Dallas, Texas.
Los Angeles, Cal.
Tulsa, Oklahoma.
Seattle, Washington.
Columbia, S. Carolina.
Salt Lake City, Utah.
Kansas City, Missouri.

This Cross Bending Test Proves Flexibility of

MONO-CAST PIPE



An individual Mono-cast pipe is inherently flexible, due to the "bendability" of the iron. More than that, however, a Mono-cast pipe line is flexible because the bell is strong enough to permit joint deflection without injury to the line.

And the BEAD cast on the spigot makes a joint hold together under most severe movement in any direction.

Testing the strength of the Bell

Top view shows Mono-cast Joint being deflected to destruction by Underwriters Laboratories, Inc., and while under hydrostatic pressure. Bottom is close up view of Mono-cast bell after it finally broke, proving toughness of the iron.

AMERICAN CAST IRON PIPE COMPANY
BIRMINGHAM, ALA.

TRADE MARK

ACIPCO MONO-CAST CENTRIFUGAL PIPE

BELL AND SPIGOT

250 miles of pipe–120 carloads of coating

The Largest Order Ever Placed for Pipe Line Coating

120 carloads of BITUMASTIC ENAMEL —each carload weighing 40,000 lbs.— have been ordered to protect the 250 miles of 20 in. steel pipe being laid from the Texas Panhandle to Wichita, Kan., by the Empire Gas and Fuel Company, a subsidiary of the Cities Service Co. This is the largest order for pipe coating ever placed with a single concern and was adopted only after most painstaking investigation by the engineers in charge.

Distributors of manufactured gas may not require such large quantities but they have real need for adequate protection. Whether used upon one mile of pipe or on a hundred miles, BITUMASTIC ENAMEL furnishes the most durable, economical and dependable protection against electrolysis and corrosion that has ever been evolved either in this country or abroad. It provides, in fact, the only practical and positive means for preserving the *full strength* of your lines for a lifetime of uninterrupted service and, as distribution pressures are being constantly increased, this preservation of full strength becomes vitally important.

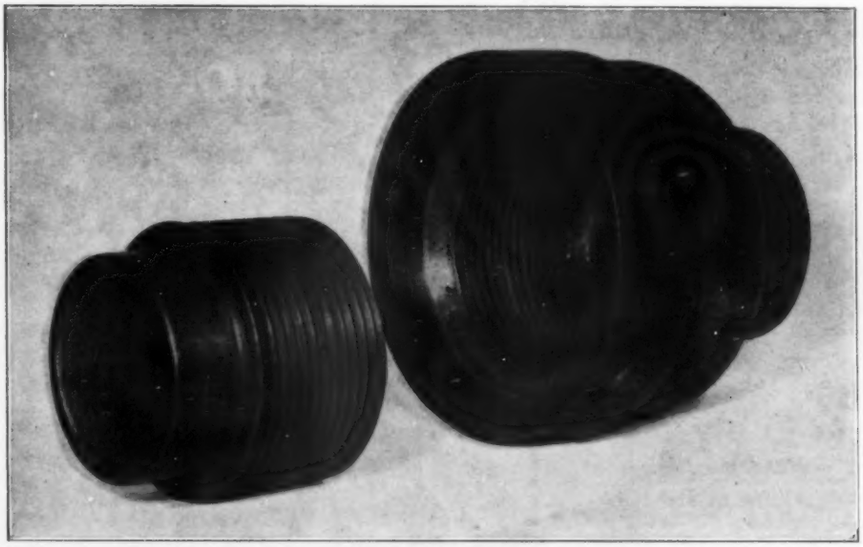
To avoid relaying of your lines when higher pressures are required, follow the example of the natural gas industry where high pressures have been used for years. Engineers in charge of the world's largest natural gas lines have adopted the use of

BITUMASTIC
REG. U.S. PAT. OFF.
ENAMEL

Write for our complete book—"The protection of Pipe Lines"

Wailes Dove-Hermiston Corporation
Whitehall Building, New York

Philadelphia Cleveland Chicago Tulsa San Francisco



Illustrating Joint Design of McWane Screwed Joint Cast Iron Pipe.

"Perhaps It's Just As Well"

That *all* gas distribution men do not yet know about McWane Screw Joint Cast Iron Gas Pipe in small sizes for high pressures.

If they did, we couldn't possibly supply the demand. A Southern gas superintendent writes in February:

"I recommend it to anyone interested in tight joints and cheap laying costs."

In July he reports "The McWane pipe laid is perfectly tight."

"The 4-inch screwed joint gas pipe has worked out very satisfactorily," writes a Northern gas official.

See this pipe and joint for yourself at Booth 120 in the Stevens Hotel Basement at this A. G. A. Convention. It can't rust, it holds the gas, and it comes in long laying - lengths, in sizes 1¼ inches upward.

McWANE CAST IRON PIPE COMPANY

Birmingham, Ala.

BOOTH 120, BASEMENT, A. G. A. CONVENTION, CHICAGO

819 Bankers Trust Bldg.
Philadelphia, Pa.

208 So. LaSalle St.
Chicago, Ill.

1807 Santa Fe Bldg.
Dallas, Texas

PACIFIC STATES CAST IRON PIPE COMPANY, PROVO, UTAH

606 Surbway Term. Bldg.
Los Angeles, Calif.

611 Spalding Bldg.
Portland, Oregon

149 West 2nd South
Salt Lake City, Utah

FULTON LOW PRESSURE GOVERNORS

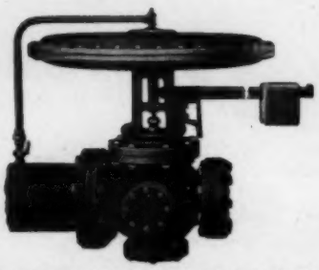
Fulton Low Pressure Governors are designed to reduce the pressure in the service mains as low as may be convenient for safe and economical combustion.

They are generally used to reduce from one to fifty pounds on the high pressure side to a few ounces.

They may be set to reduce to two ounces, or any pressure up to one pound. Any pressure desired is instantly accomplished by changing the weight on the lever.

Our improved style of valve makes a perfectly tight joint, thus preventing increase of pressure on low side when the consumption is light or entirely shut off; and, being perfectly balanced, it is not affected by the variations of pressure that may occur on the inlet side.

Made in all sizes up to 24 inches.



Send for our illustrated catalog

The CHAPLIN-FULTON MANUFACTURING CO.
PITTSBURGH PENNSYLVANIA

BAROMETERS

PHILADELPHIA, THE WORKSHOP OF THE WORLD, has 14,000 Manufacturing Establishments of which many have World-Wide Reputations.

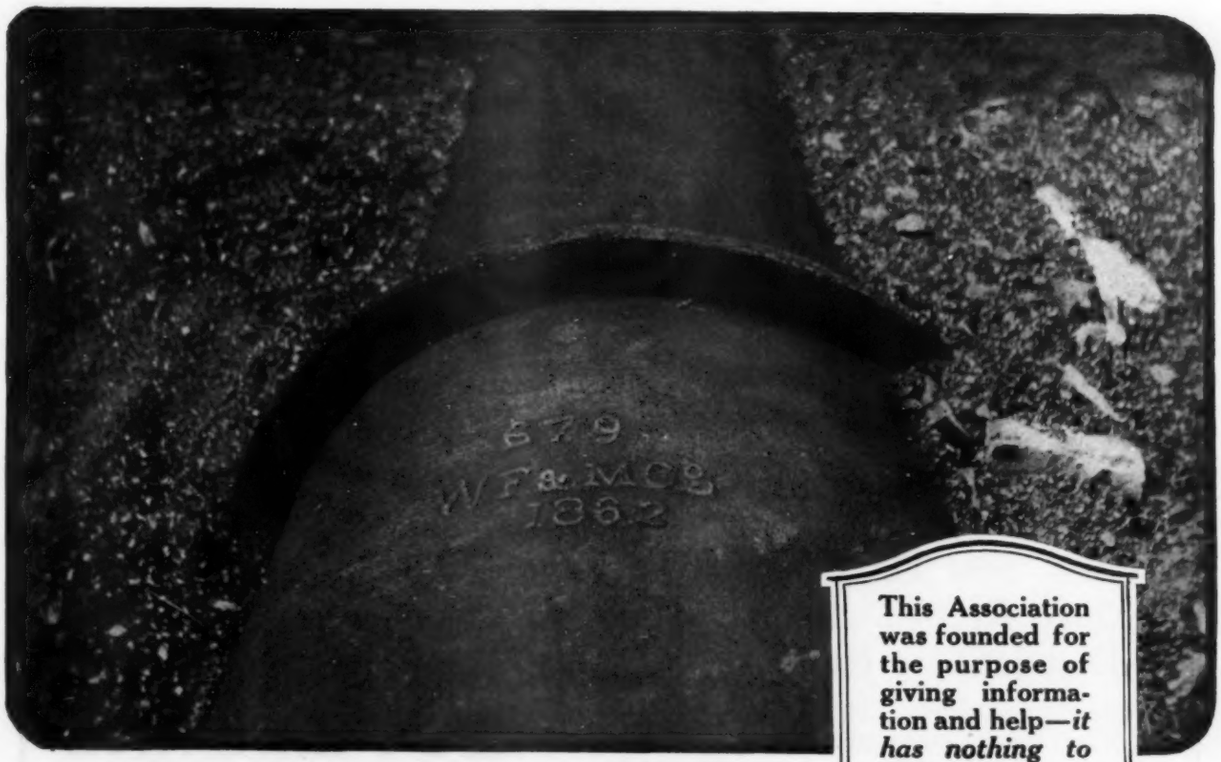
"PRINCO" STANDARD FORTIN MERCURIAL BAROMETERS

are in World-Wide use because they, too, have a "World-Wide Reputation"

THEY ARE GOOD BAROMETERS
THEY ARE REASONABLE IN PRICE!

For more than a decade they have been made in such manner that they can be shipped safely and successfully wherever there is a common carrier. This has been recognized as an achievement in Barometry.

PRECISION THERMOMETER & INSTRUMENT COMPANY
1439 BRANDYWINE STREET - - - - - - PHILADELPHIA, PA.



"679 WF&M Co. 1862"

(Warren Foundry & Machine Company)

Such inscriptions, brought to light from time to time, are constant reminders of the permanence and low maintenance cost of Cast Iron Pipe

IN fact there is no case where Cast Iron Pipe has worn out under the usual service conditions.

It is a standard of practice where Cast Iron mains have to be replaced with larger diameter pipe to relay the old pipe elsewhere.

There is therefore no data available to determine the ultimate working life of Cast Iron Pipe. One of the earliest installations on record is one that was laid in Europe 250 years ago. This pipe is in as good condition today as it was when installed.

CAST IRON PIPE RESEARCH ASSOCIATION
People's Gas Building, Chicago, Ill.

This Association was founded for the purpose of giving information and help—*it has nothing to sell.*

Its primary interest is the collection and distribution of all information relative to Cast Iron Pipe for all purposes—and in arousing public interest in waterworks construction.

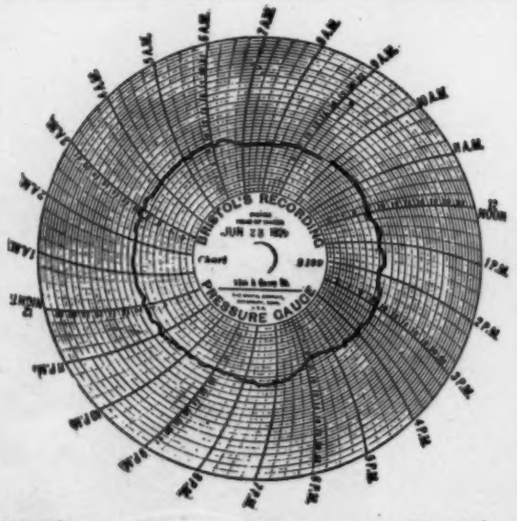
Consulting engineers, contractors and municipal officials are invited to write.

Of especial importance is an article on the "two mains system." Write to the Research Engineer for a copy of this or other literature on the subject of water systems which may be interesting to you.

BELL *and* SPIGOT JOINT—
the accepted standard for underground construction.

CAST IRON PIPE

—In continuous service for over 250 years



When You Have a Daily "*Chart Record*" Report of District Gas Pressures

It takes but a moment to glance over each chart and know exactly what pressure was held, yesterday afternoon or last night, at any section in the distribution system.

Should complaint of low pressure be received it is a simple matter for you to refer to the chart of the district in question and quickly determine the justice of such complaint.

The Minneapolis Gas Light Company, Minneapolis, Minn., has 39 Bristol's Recording Pressure Gauges installed in various sections of the city. The charts collected each morning constitute an accurate survey of pressure conditions for the whole system.

The Bristol's Recording Pressure Gauge is simple, rugged, and singularly free from trouble-giving parts. In fact, it requires nothing but routine attention.

Write for new Gas Bulletin No. 357.

The Bristol Company *Waterbury, Connecticut*

FOR 38 YEARS — MAKERS OF

BRISTOL'S RECORDING INSTRUMENTS

Boston
New York
Philadelphia
Pittsburgh
Birmingham
Detroit
Chicago
St. Louis
Denver
San Francisco

PAINT and MOISTURE

Resistance to dampness is an important factor in the life of a protective paint as corrosion does not occur except in the presence of moisture.

DIXON'S SILICA-GRAPHITE PAINT

with its pigment of flake silica-graphite possesses to an unusual degree that peculiar quality of water repellancy.

Because of this characteristic, as well as its oily nature and flake formation, Dixon's Silica-Graphite Paint is unequalled in resisting corrosion and providing protection.

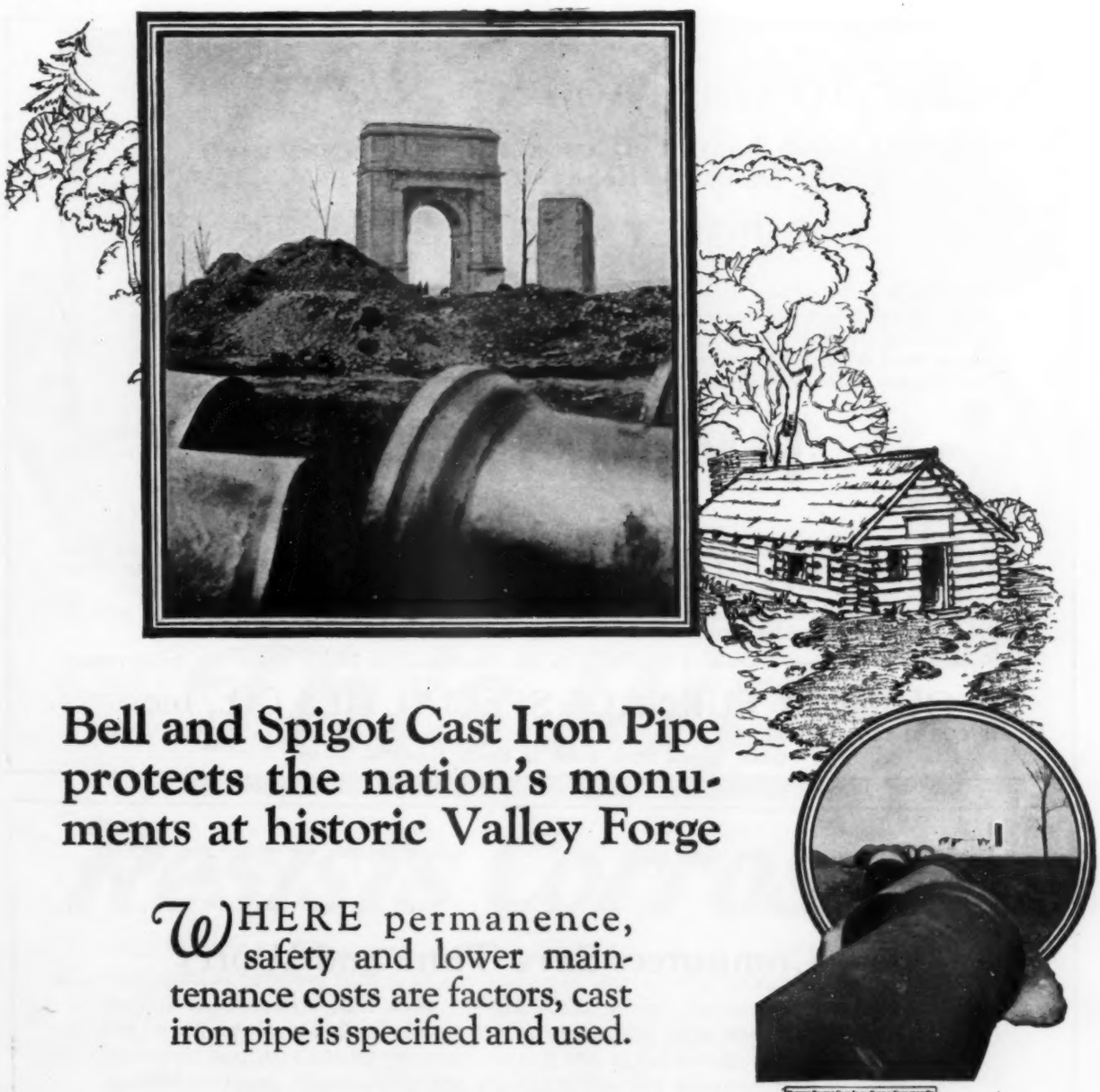
The result is that Dixon's Silica-Graphite Paint, judged by its cost per-year-of-service, is far more economical than the "cheaper-per-gallon" paints.

Write for booklet and color card 231-*B*

Joseph Dixon Crucible Company

Jersey City **New Jersey**

1827—ONE HUNDREDTH ANNIVERSARY—1927



Bell and Spigot Cast Iron Pipe protects the nation's monuments at historic Valley Forge

WHERE permanence, safety and lower maintenance costs are factors, cast iron pipe is specified and used.

Write for new illustrated hand-book which contains full specifications and other valuable data for construction engineers.

Makers of deLavaud Centrifugal Cast Iron Pipe PATENTED

United States Cast Iron Pipe and Foundry Company

General Offices:
Burlington, New Jersey

SALES OFFICES

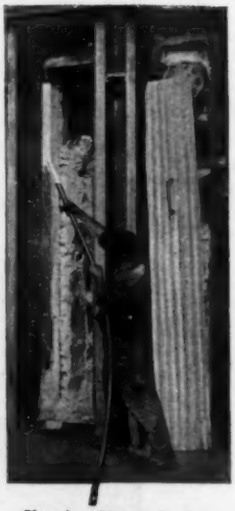
Philadelphia: 1421 Chestnut St.
Chicago: 122 So. Michigan Blvd.
Birmingham: 1st Ave. & 20th St.
Buffalo: 957 East Ferry Street
Cleveland: 1150 East 26th Street
Minneapolis: 6th St. & Hennepin Ave.
New York: 71 Broadway
San Francisco: 3rd & Market Sts.
Pittsburgh: 6th & Smithfield Sts.
Dallas: Akard & Commerce Sts.
Kansas City: 13th & Locust Sts.

Repair in the Modern Way

Retorts, Jamb Joints, Furnace Walls, Arches and Baffles Should Be Repaired With the

QUIGLEY GUN

The Quigley Refractory Gun fills cracks, repairs retorts, jamb joints of coke ovens, furnace walls, arches, baffles, etc. It shoots the plastic mixture with great velocity so that it sticks, where hand troweled or rammed-in applications might fail to hold. The Quigley Gun also makes hot patches.



Shooting Hytempite into Jamb Joint with the Quigley Refractory Gun.

HYTEMPITE

(Reg. U. S. Pat. Off.)

HYTEMPITE is used by hundreds of Gas Companies for laying up firebrick, (and when mixed with crushed old firebrick or Ganisand) for patching and repairing refractory linings, making special shapes and tile, etc.

The mixture of Hytempite and crushed old firebrick applied to wall or joint with the Quigley Gun makes certain an everlasting gas tight surface.

Keep a drum of Hytempite in the retort house or Boiler Room for quick repairs

QUIGLEY FURNACE SPECIALTIES CO., Inc.

26 CORTLANDT STREET NEW YORK

Quick Service from Stock in Every Industrial Center

Cox Computers Save Time and Worry

For low pressures—$3.50 For high pressures—$5.00

ORDERS FILLED IMMEDIATELY

AMERICAN GAS JOURNAL 53 Park Place, N. Y.

This Pipe Resists Corrosion

"NATIONAL" Pipe, butt-weld sizes ½ to 3-inch, is made by a special mechanical process that actually removes one of the principal causes of corrosion, namely, mill-scale. This scale, which forms on the skelp in the welding furnace, is electronegative to the pipe metal and sets up galvanic action, causing pitting around the scale areas. Therefore, this special process, eliminating the scale, makes the finished pipe highly resistant to that form of corrosion known as "pitting" and insures longer life from gas lines. Another advantage of scale free pipe especially important to the gas industry is freedom from loose scale—which means that small orifices and meters are unclogged and in good working condition.

Being a patented feature developed by this company, only "NATIONAL" Pipe is

MADE BY THE SCALE FREE PROCESS

We will be glad to send Bulletin No. 7, which explains the advantages of Scale Free Pipe—the pipe that is especially made to resist corrosion.

NATIONAL TUBE COMPANY, PITTSBURGH, PA.

GENERAL SALES OFFICES: FRICK BUILDING

DISTRICT SALES OFFICES

Atlanta Boston Chicago Denver Detroit New Orleans New York Salt Lake City Philadelphia Pittsburgh St. Louis St. Paul

Pacific Coast Representatives: U. S. Steel Products Co. San Francisco Los Angeles Portland Seattle

Export Representatives: U. S. Steel Products Co. New York City

Improved

IRON BORING OXIDE

Gas Purification at Lowest Cost

Our Improved Iron Boring Oxide will *remove* the largest amount of H_2S *at lowest cost.* It has earned an enviable reputation for its *low resistance to flow of gas,* and uniform purifying value at different stages of its active life as well.

The outstanding features of Improved Iron Boring Oxide are

ACTIVITY—ENDURANCE
REVIVABILITY

Let Us Help Solve Your Purifying Problems

GAS PURIFYING MATERIALS CO.

Foot of Halsey Street Long Island City, N. Y.

Branch Yard to Serve New England

Providence, Rhode Island

FLANGE END

VALVES

We can furnish Valves for working pressures up to 1200 lbs. per sq. in.

Send for Circular 5

The LUDLOW

VALVE MANUFACTURING COMPANY

TROY, N. Y.

New York 82 Gold Street | Boston Tremont Bldg. | Philadelphia Harrison Building

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RITER-CONLEY CO.

STEEL CONSTRUCTION

PITTSBURGH

STEEL PLATEWORK

FOR

THE GAS INDUSTRY

Gas Holders
Pressure Tanks
Steel Pipe
Steel Barges
Oil Tanks
Purifiers

BRANCH OFFICES

New York — Boston — Baltimore
Chicago — Philadelphia — Detroit
Cleveland — Cincinnati — Seattle
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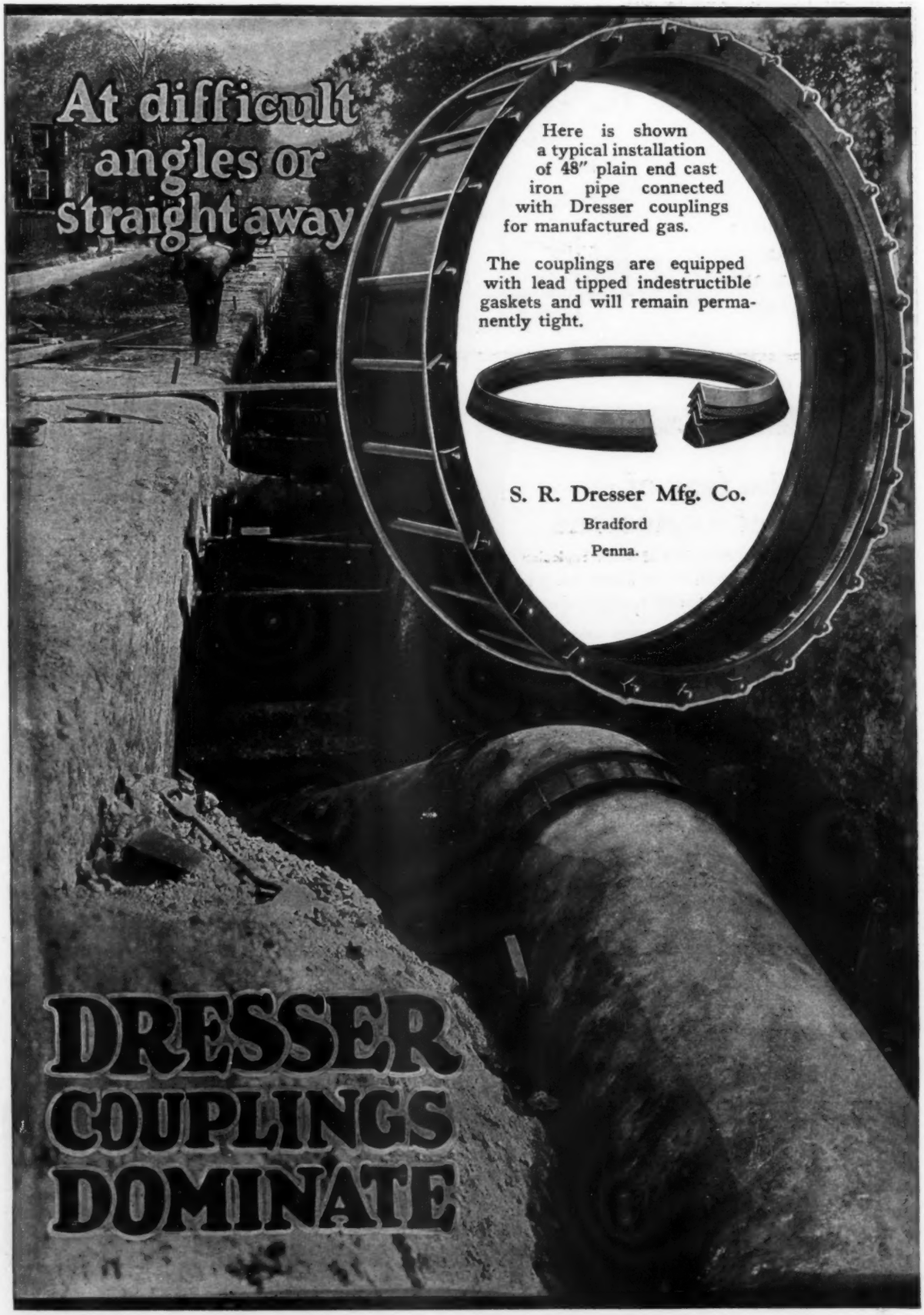
LEADING GAS COMPANIES USE LAMBERT METERS

All sizes up to 3,400 cu. ft. capacity

Meters
Diaphragms
Repairs
Provers
Pumps
Calorimeters
Wet Meters
Gauges
Apparatus

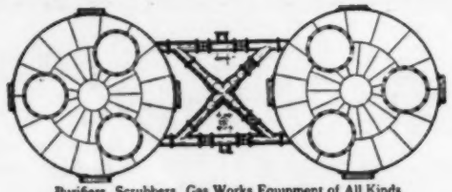
LAMBERT METER CO.

BUSH TERM. BLDG. 4, BROOKLYN, N. Y.

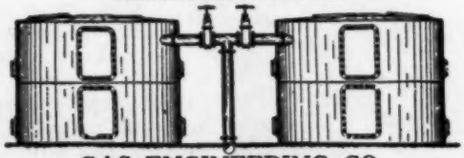

At difficult angles or straight away
Here is shown a typical installation of 48" plain end cast iron pipe connected with Dresser couplings for manufactured gas.
The couplings are equipped with lead tipped indestructible gaskets and will remain permanently tight.
S. R. Dresser Mfg. Co.
Bradford
Penna.
DRESSER COUPLINGS DOMINATE

Gas Holders
Gas Purifiers
Scrubbers
Condensers

PLATE METAL WORK RIVETED AND WELDED



Purifiers, Scrubbers, Gas Works Equipment of All Kinds
Welded and Riveted Plate Metal Work



GAS ENGINEERING CO.
TRENTON, NEW JERSEY

Apparatus for Making Coal Gas, Carburetted Water Gas, Hydrogen, Blue Water Gas, Producer Gas, Inert Gases

COMPLETE INSTALLATIONS

End the fear of boiler explosions

There need be no more fear of boiler explosion once a Red Top Relief Valve Model No. 1 is installed in a domestic hot water supply system.

This valve relieves rising pressures before they reach the danger point. It works on the gravity principle, pressure in the system forcing a nickel weighted piston from the valve seat.

Note, in the sectional view, that the weight is cast in four sections. This permits relief at 50, 75, 100 or 130 lbs.

Sectional View of Model No. 1

May we give you further data?

Neptune Meter Company,
50 E. 42nd St., New York City
Branch Offices in Principal Cities

Red Top Relief Valves

CINCINNATI

Overnight from nearly all cities

America's logical Convention City.

HOTEL GIBSON

1,000 Rooms, $2.50 Up

Cincinnati's Logical Convention Headquarters

2 Mammoth Ball Rooms Seating Over 1,000 Each
20,000 Sq. Ft. Foyer Space for Displays
Accommodations for More Than 2,500 Guests

WRITE FOR BOOKLET
RALPH HITZ, Manager

Russell Engineering Company St. Louis

Coal Carbonization Plants, Benches, Repairs, Improvements, Extensions, Apparatus

As Usual

The 1927 Edition of the

American Gas Catalog

Has Met the Unqualified Approval of the American Gas Industry from Coast to Coast

Immediately upon delivery of this annual "Reference Book of the Gas Industry," hundreds of Gas Executives, representing every branch of the industry, wrote acknowledgment of its receipt and expressed their appreciation in no uncertain terms. From the many we cite the few which follow:

FROM A MANAGER:
"We prize this book very highly. In fact, we received Catalog this A. M., and it has made it possible for us to select a ———— that we were unable to find until we looked through this Catalog."

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"The book is very complete and very helpful to anyone in the gas business."

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"A very attractive Catalog which should prove useful in purchasing supplies, materials and appliances."

FROM A PLANT SUPT.:
"We all here derived so much good from the 1926 American Gas Catalog that it is with much pleasure we acknowledge receipt of the 1927 copy."

FROM A SUPERINTENDENT:
"I consider it the most valuable periodical published; as for knowledge it furnishes in all branches of the gas industry it has no equal."

FROM A DISTRICT MANAGER:
"This is a part of my daily life."

FROM A GAS ENGINEER:
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FROM A DISTRICT MANAGER:
"We find your Catalog very valuable when looking up advertisers for all kinds of gas equipment."

It is indeed very gratifying to learn, through the many expressions of opinion received, that our efforts to produce a really helpful reference book for every branch of the industry has merited the approval of Chief Executives, Superintendents, Managers, Engineers and Purchasing Agents, and we extend our sincerest thanks to those who took the trouble to write us the many kind words of appreciation.

Cordially yours,

AMERICAN GAS JOURNAL PUBLISHERS.

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If additional copies of the American Gas Catalog are desired, they can be obtained for $2.50 each—while they last. The edition is limited.

WESTMORELAND "CRITERION" GAS COAL

The Standard for Gas Making Since 1854

Since this Company commenced operations, its well-known Westmoreland "Criterion" Gas Coal has been largely used by the Gas Companies of Northeastern United States and Canada, and its character is established as having no superior in gas giving qualities and freedom from sulphur and other impurities.

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MANUFACTURERS OF:

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Coal Conversion Corporation

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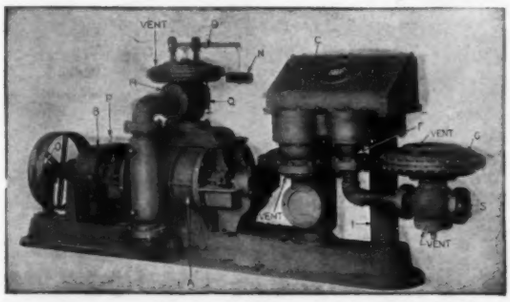

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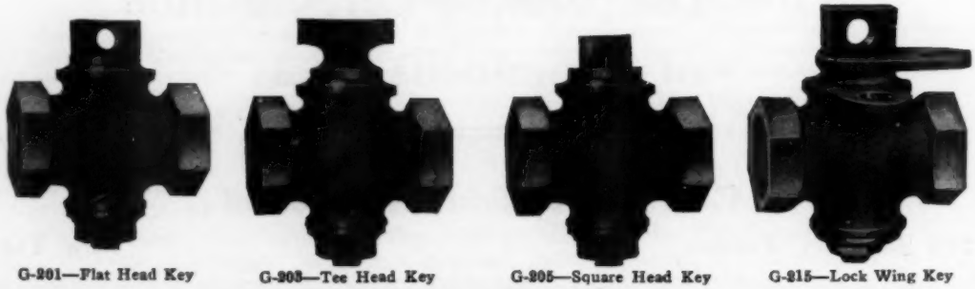
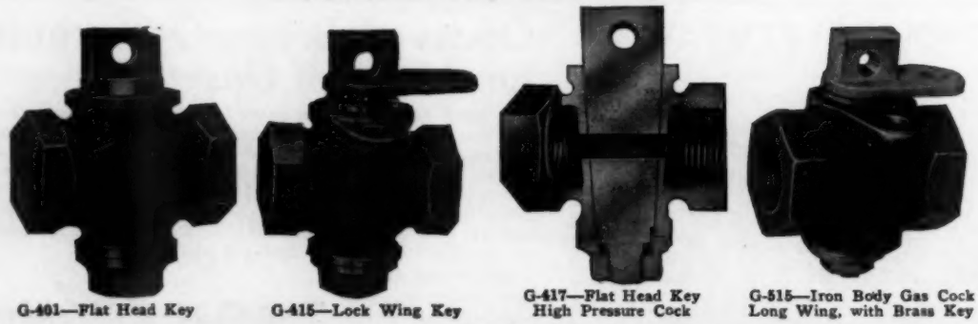


G-201—Flat Head Key G-203—Tee Head Key G-205—Square Head Key G-215—Lock Wing Key

Extra Heavy Gas Cocks



G-401—Flat Head Key G-415—Lock Wing Key G-417—Flat Head Key High Pressure Cock G-515—Iron Body Gas Cock Long Wing, with Brass Key

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PIPE CUTTER

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"European Plan"
Famous French Grill and Restaurant
"A rendezvous for those who seek the best"
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SHELBURNE CONCERT ORCHESTRA
Proprietary-Management,
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To secure the right man for whom you are seeking, state your needs here and the man you want will quickly respond.

To the Skilled Worker

If you are looking for betterment, tell your wants here, with every confidence that they will become known to those you desire to reach.

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FOR SALE — Franchise, production and distribution natural gas system. Great opportunity for development which present owner cannot finance; town of 4,500; pays well now and number of consumers can be quadrupled and contract made for additional supply of gas; 35 shallow wells; no indebtedness; capital stock, $24,000. Price, $24,000. G. A. Watt, North East, Penna.

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Strong, Simple, Durable.
Will Crush any Size Desired.

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IRON Connelly Iron Sponge and Governor Co. New York, Chicago U.S.A. **SPONGE**
USE THE BENEFIT OF 50 YEARS EXPERIENCE!

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See page 137 for advertisements of these products

ACCUMULATORS—STEAM
Ruth's Steam Accumulator Co.
Semet Solvay Engineering Corp.
Smoot Engineering Corp.
The Gas Machinery Co.
The U. G. I. Contracting Co.

AIR-LINE MASK
The Safety Gas Main Stopper Co.

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Bartlett-Hayward Co.
Cruse-Kemper Co.
The Gas Machinery Co.
Isbell-Porter Co.
Riter-Conley Co.
Semet Solvay Engineering Corp.
The Stacey Bros. Gas Const. Co.
The Stacey Manufacturing Co.
John S. Unger.
Western Gas Construction Co.

AMMONIA CONCENTRATED LIQUOR PLANTS
Semet-Solvay Engineering Corp.
Western Gas Construction Co.

AMMONIA PIPE
National Tube Co.

AMMONIA RECOVERY APPARATUS
Semet-Solvay Engineering Corp.
Western Gas Construction Co.

AMMONIA STILLS
Bartlett-Hayward Co.
Cruse-Kemper Co.
The Gas Machinery Co.
Isbell-Porter Co.
The Koppers Construction Co.
Riter-Conley Co.
Russell Engineering Co.
Semet Solvay Engineering Corp.
Stacey Bros. Gas Constr. Co.
The Stacey Mfg. Co.
John S. Unger.
Western Gas Construction Co.

APPRAISALS & INVENTORIES
The U. G. I. Contracting Co.

ASBESTOS PACKING
Safety Gas Main Stopper Co.

ASH STORAGE BINS
Semet-Solvay Engineering Corp.
Western Gas Construction Co.

AUTOMATIC RAILWAYS
C. W. Hunt Co., Inc.

BAGS
Connelly Iron Sponge & Gov. Co.
Rubber & Canvas Covered
Safety Gas Main Stopper Co.

BAROMETERS
Precision Ther. & Inst. Co.

BENCHES
The Gas Machinery Co.
The Improved Equipment Co.
Isbell-Porter Co.
The Jersey City Refractories Co., Inc.
Russell Engineering Co.
Semet Solvay Engineering Corp.
The Stacey Mfg. Co.
The U. G. I. Contracting Co.
Western Gas Construction Co.

BENCHES
Complete
Semet Solvay Engineering Co.
Walsh Fire-Clay Products Co.
West Gas Improvement Co.

BENZOL
Bartlett-Hayward Co.
Carl Still, Incorporated.
The Koppers Construction Co.
Semet Solvay Engineering Corp.
Western Gas Construction Co.

BLOWERS
The Connersville Blower Co.
P. H. & F. M. Roots Co.

BLOWERS & BOOSTERS
American Gas Furnace Co.
Gas Engineering Co.
The Gas Machinery Co.
P. H. & F. M. Roots Co.
Semet Solvay Engineering Corp.
The U. G. I. Contracting Co.
Western Gas Construction Co.

BLOW PIPES
American Gas Furnace Co.

BLUE GAS PLANT
Bartlett-Hayward Co.
Carl Still, Incorporated.
Gas Engineering Co.
The Gas Machinery Co.
The Improved Equipment Co.
Isbell-Porter Co.
Semet Solvay Engineering Corp.
The Stacey Mfg. Co.
The U. G. I. Contracting Co.
Western Gas Construction Co.

BOILERS—WASTE HEAT
Bartlett-Hayward Co.
Combustion Engineering Corp.
The Gas Machinery Co.
Isbell-Porter Co.
Russell Engineering Co.
Semet Solvay Engineering Corp.
The U. G. I. Contracting Co.
Western Gas Construction Co.
West Gas Improvement Co.

BRICK
Silica
E. J. Lavino & Co.
Walsh Fire-Clay Products Co.

BRICK, FIRE AND CHECKER
The Jersey City Refractories Co., Inc.
Russell Engineering Co.
Semet Solvay Engineering Corp
The U. G. I. Contracting Co.
Walsh Fire-Clay Products Co.
Western Gas Construction Co.

BRUSHES, PIPE CLEANING
Safety Gas Main Stopper Co.

B. T. U. INDICATORS
The U. G. I. Contracting Co.

BURNERS (Industrial)
Fuel
The C. M. Kemp Mfg. Co.
Roberts Gas Burner Co.

BY-PRODUCT PLANTS
Bartlett-Hayward Co.
Carl Still, Incorporated.
Internat'l Coal Carbonization Co.
The Gas Machinery Co.
The Koppers Construction Co.
Riter-Conley Co.
Semet Solvay Engineering Corp.
The U. G. I. Contracting Co.
Western Gas Construction Co.
West Gas Improvement Co.

CABLE RAILWAYS
C. W. Hunt Co., Inc.

CALORIMETERS
Alpha-Lux Company (Inc.).
American Meter Co.
Lambert Meter Co.
D. McDonald & Co.
Metric Metal Works

CARBURETTED WATER GAS PLANTS
Semet-Solvay Engineering Corp.
Western Gas Construction Co.

CARS
C. W. Hunt Co., Inc.

CAST IRON FITTINGS
James B. Clow & Sons

CEMENTS
The Jersey City Refractories Co. Inc.
Russell Engineering Co.
Walsh Fire-Clay Products Co.

CEMENTS, ACID-PROOF
Quigley Furnace Spec. Co., Inc.

CEMENTS, FIREBRICK
Quigley Furnace Spec. Co., Inc.
Walsh Fire-Clay Products Co.

CEMENTS, HIGH TEMPERATURE
Quigley Furnace Spec. Co., Inc.

CEMENTS
Refractory
E. J. Lavino & Co.

CHARGING MACHINERY
Bartlett-Hayward Co.
The Gas Machinery Co.
Isbell-Porter Co.
Russell Engineering Co.
Semet Solvay Engineering Corp.
Western Gas Const. Co.

CHUTES
C. W. Hunt Co., Inc.

CLAMPS (PIPE)
S. R. Dresser Manufacturing Co.

COALS
North American Coal Corp.
Westmoreland Coal Co.

COAL GAS APPARATUS
Bartlett-Hayward Co.
Carl Still, Incorporated.
The Gas Machinery Co.
Isbell-Porter Co.
The Koppers Construction Co.
Russell Engineering Co.
Semet Solvay Engineering Corp.
The Stacey Mfg. Co.
The U. G. I. Contracting Co.
Western Gas Construction Co.

COAL & COKE BINS CASTINGS
Semet-Solvay Engineering Corp.
Western Gas Construction Co.

COAL AND COKE HANDLING MACHINERY
Bartlett-Hayward Co.
C. W. Hunt Co., Inc.
Dry Quenching Equipment Corp.
Isbell-Porter Co.
C. M. Keller
The Koppers Construction Co.
Riter-Conley Co.
Russell Engineering Co.
Semet Solvay Engineering Corp.
The U. G. I. Contracting Co.
Western Gas Construction Co.

COAL TAR PRODUCTS
Western Gas Construction Co.

COAL TUBS
C. W. Hunt Co., Inc.

COCKS
Meter
Kitson Company
Service
Kitson Co.

COKE CRUSHERS
C. M. Keller
Semet Solvay Engineering Corp.

COMPUTERS
Heating Value
The U. G. I. Contracting Co.

CONDENSERS
Bartlett-Hayward Co.
Cruse-Kemper Co.
Gas Engineering Co.
The Gas Machinery Co.
Isbell-Porter Co.
Riter-Conley Co.
Semet Solvay Enginering Corp.
The Stacey Bros. Gas Constr. Co.
The Stacey Mfg. Co.
Western Gas Construction Co.
West Gas Improvement Co.
High Duty
The U. G. I. Contracting Co.

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C. W. Hunt Co., Inc.

CONTROLS
American Gas Furnace Co.
Bartlett-Hayward Co.
The Gas Machinery Co.
Robertshaw Thermostat Co.
Semet Solvay Engineering Corp.
Smoot Engineering Corp.
The U. G. I. Contracting Co.
Western Gas Construction Co.

CONVEYORS
C. W. Hunt Co., Inc.
Isbell-Porter Co.
The Koppers Construction Co.
Semet Solvay Engineering Corp.

CONCENTRATORS AMMONIA
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The Gas Machinery Co.
Isbell-Porter Co.
Semet Solvay Engineering Corp.

COOLERS
Semet-Solvay Engineering Corp.
Western Gas Construction Co.

COUPLINGS
Bartlett-Hayward Co.
S. R. Dresser Manufacturing Co.
National Tube Co.
P. H. & F. M. Roots Co.

CRUSHERS
C. W. Hunt Co., Inc.

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R. D. Wood & Co.

DERRICK—PIPE
Safety Gas Main Stopper Co.

DISCHARGING MACHINERY
Bartlett-Hayward Co.
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Bartlett-Hayward Co.
The Improved Equipment Co.
The Koppers Construction Co.
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Smoot Enginering Corp.
Consulting
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Russell Engineering Co.
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Cruse-Kemper Co.
Gas Engineering Co.
Isbell-Porter Co.
The Improved Equipment Co.
The Koppers Construction Co.
Russell Engineering Co.
Semet Solvay Engineering Corp
The Stacey Bros. Gas Constr. Co.
The Stacey Mfg. Co.
The U. G. I. Contracting Co.
West Gas Improvement Co.
Designing
Western Gas Construction Co.

EXHAUSTERS
American Gas Furnace Co.
The Connersville Blower Co.
The Gas Machinery Co.
Isbell-Porter Co.
The Stacey Mfg. Co.
The U. G. I. Contracting Co.

FIREBRICK—CHECKER BRICK
The Jersey City Refractories Co., Inc.
Russell Engineering Co.
Semet Solvay Engineering Co.
The U. G. I. Contracting Co.
Walsh Fire-Clay Products Co.
Western Gas Construction Co.

FIREBRICK, CEMENT
Quigley Furnace Spec. Co., Inc.
Walsh Fire-Clay Products Co.

FITTINGS
Isbell-Porter Co.
The Gas Machinery Co.
Semet Solvay Engineering Corp.
The Stacey Mfg. Co.
U. S. Cast Iron Pipe & Fdy. Co.
Warren Foundry & Pipe Co.
Western Gas Construction Co.
R. D. Wood & Co.
Cast Iron
Cast Iron Pipe Publicity Bureau

FITTINGS, FLANGED
U. S. Cast Iron Pipe & Fdy. Co.

FITTINGS
Pipe
American Cast Iron Pipe Co.
Semet-Solvay Engineering Corp.

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General Gas Light Co.
Welsbach Co.

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Western Gas Construction Co

FLUE PIPE (Cast Iron Oval)
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FLUES (Consuming) for Gas Range
Akme Flue, Inc.

FORGES
American Gas Furnace Co.

FURNACES (Case Hardening)
Cyanide
Muffle
Oil Tempering
Oven
American Gas Furnace Co.

FURNACES (Case Hardening)
Gas Fired
Warm Air
Geo. D. Roper Co.

GAS ANALYSIS APPARATUS
American Meter Co.
S. R. Dresser Manufacturing Co.
Metric Metal Works
Precision Ther. & Inst. Co.
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Safety Gas Main Stopper Co.

GAS MASKS
Safety Gas Main Stopper Co.

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Bartlett-Hayward Co.
Carl Still, Incorporated.
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Gas Engineering Co.
The Improved Equipment Co.
Isbell-Porter Co.
Russell Engineering Co.
Semet Solvay Engineering Corp.
The Stacey Bros. Gas Const. Co.
The Stacey Mfg. Co.
The U. G. I. Contracting Co.
Western Gas Construction Co.
West Gas Improvement Co.

GAS TESTING APPARATUS
Alpha-Lux Company, Inc.
Lambert Meter Co.
Metric Metal Works
Pittsburgh Equitable Meter Co.
Precision Ther. & Inst. Co.
Superior Meter Co.
The U. G. I. Contracting Co.

GAUGE BOARDS
Western Gas Construction Co.

GAUGES
American Meter Co.
The Bristol Co.
Connelly Iron Sponge & Gov. Co.
Helme & McIlhenny
Lambert Meter Co.
Maryland Meter Works
Metric Metal Works

LOOKING BACKWARD 30 YEARS

The Use of Gas Has Increased 500% Since 1895

Notwithstanding the loss of a large percentage of gas lighting, the diversified use of gas for domestic and industrial purposes has very materially increased the sales per meter.

The peak demand load is constantly increasing and is of such a nature that volume, as well as pressure, is required for the best results.

From a study of the individual records of several hundred thousand meters, summarized according to the system of the

FOUR CARDINAL POINTS

it is very evident that meters with additional capacity for the volume required hold their proof far better and have a longer life than meters which are overloaded and overworked.

LOOKING AHEAD 30 YEARS

The Lifetime of Our Meters

We strongly urge the placing of meters of greater capacity and volume for domestic and industrial customers where surroundings and industry indicate a prospective increased use of gas.

Capacities at One-Half Inch Loss in Pressure

5-B Capacity	150 Cu. Ft. Per Hour	100-B Capacity	1,800 Cu. Ft. Per Hour
10-B Capacity	300 Cu. Ft. Per Hour	150-B Capacity	3,000 Cu. Ft. Per Hour
20-B Capacity	450 Cu. Ft. Per Hour	250-B Capacity	4,500 Cu. Ft. Per Hour
30-B Capacity	600 Cu. Ft. Per Hour	500-B Capacity	7,500 Cu. Ft. Per Hour
80-B Capacity	1,250 Cu. Ft. Per Hour		

19 Years Experience

With the B-Type Meter

1860 **67 Years in Boston** **1927**

Manufacturing the Glover Type Meters

NATHANIEL TUFTS METER WORKS

of

American Meter Company

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Buyers' Reference Index

See page 137 for advertisements of these products

Safety Gas Main Stopper Co.
Pressure-Recording
D. McDonald & Co.
Superior Meter Co.

GLOVES
Rubber
Leather
Safety Gas Main Stopper Co.

GOVERNORS
The Stacey Mfg. Co.
Automatic
Chaplin-Fulton Mfg. Co.
Connelly Iron Sponge & Gov. Co.
Pittsburgh Equitable Meter Co.
Coke Oven
Chaplin-Fulton Mfg. Co.
Connelly Iron Sponge & Gov. Co.
The Gas Machinery Co.
The Koppers Construction Co.
Pittsburgh Equitable Meter Co.
Semet Solvay Engineering Corp
Smoot Engineering Corp.
District
Chaplin-Fulton Mfg. Co.
Connelly Iron Sponge & Gov Co.
Groble Gas Regulator Co.
Helme & McIlhenny
Isbell-Porter Co.
Pittsburgh Equitable Meter Co.
Reynolds Gas Regulator Co.
Semet Solvay Engineering Corp.
Smoot Engineering Corp.
Exhauster
Chaplin-Fulton Mfg Co.
Connelly Iron Sponge & Gov. Co.
The Connersville Blower Co.
Isbell-Porter Co.
Pittsburgh Equitable Meter Co
Smoot Engineering Corp.
High Pressure
Chaplin-Fulton Mfg. Co.
Connelly Iron Sponge & Gov. Co.
Pittsburgh Equitable Meter Co.
Reynolds Gas Regulator Co.
P. H. & F. M. Roots Co.
Smoot Engineering Corp.
The Sprague Meter Co.
Laboratory
D. McDonald & Co.
Low Pressure
Chaplin-Fulton Mfg. Co.
Connelly Iron Sponge & Gov. Co.
Pittsburgh Equitable Meter Co.
Reynolds Gas Regulator Co.
P. H. & F. M. Roots Co.
Semet Solvay Engineering Corp.
Smoot Engineering Corp.
The Sprague Meter Co.
Retort House
Chaplin-Fulton Mfg. Co.
Connelly Iron Sponge & Gov. Co.
The Gas Machinery Co.
Isbell-Porter Co.
Pittsburgh Equitable Meter Co.
Russell Engineering Co.
Semet Solvay Engineering Corp.
Smoot Engineering Corp.
Service
Chaplin-Fulton Mfg. Co.
Connelly Iron Sponge & Gov. Co.
Pittsburgh Equitable Meter Co.
Reynolds Gas Regulator Co.
Station
The Sprague Meter Co.
Chaplin-Fulton Mfg. Co.
Connelly Iron Sponge & Gov. Co.
Helme & McIlhenny
Pittsburgh Equitable Meter Co.
Reynolds Gas Regulator Co.
Semet Solvay Engineering Corp.
Station Automatic
Chaplin-Fulton Mfg. Co.
Connelly Iron Sponge & Gov. Co.
Pittsburgh Equitable Meter Co.

GRAVITOMETERS
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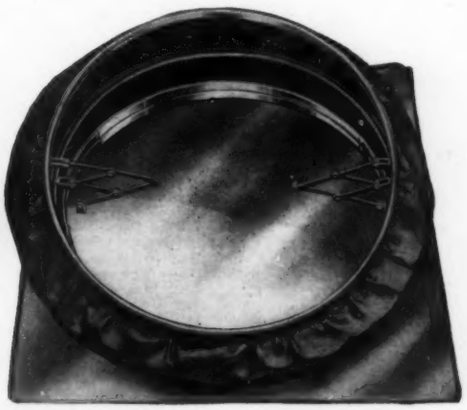

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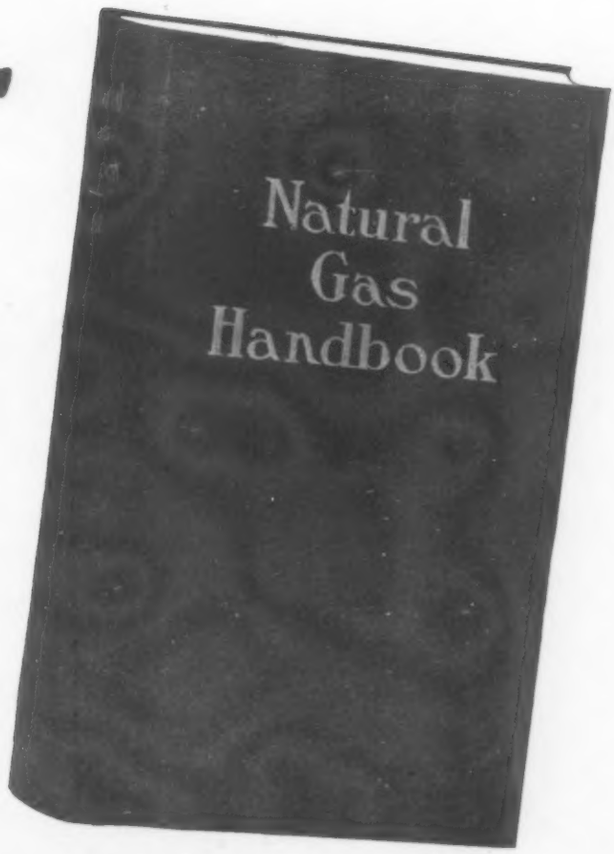

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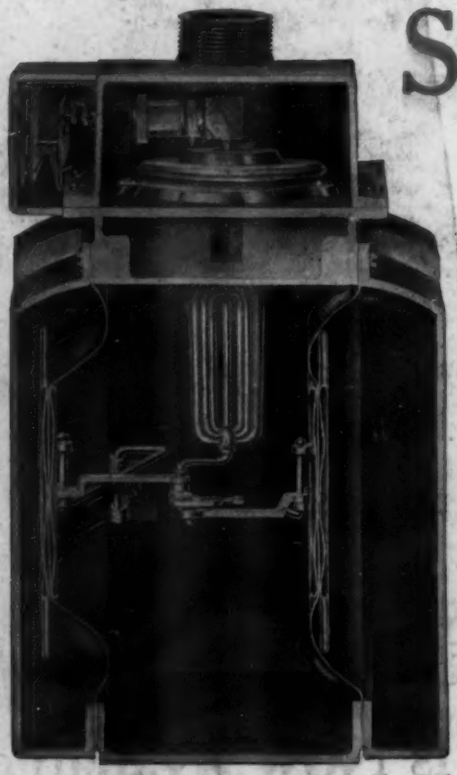

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